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**ESSAYS AND STUDIES
IN HONOR OF
MARGARET BARCLAY WILSON**

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Mayne B. Wilson

ESSAYS AND STUDIES

IN HONOR OF

MARGARET BARCLAY WILSON

TEACHER PHYSICIAN LIBRARIAN AUTHOR



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TO
MARGARET BARCLAY WILSON, A.B., M.Sc., M.D.
IN COMMEMORATION OF THE THIRTY-FIFTH YEAR
OF HER OFFICIAL CONNECTION WITH
HUNTER COLLEGE OF THE CITY OF NEW YORK
TUTOR 1887-1893
INSTRUCTOR 1893-1904
ASSOCIATE PROFESSOR 1904-1910
PROFESSOR 1910-
HONORARY LIBRARIAN 1915-
THIS VOLUME IS DEDICATED
AS A TOKEN OF AFFECTION, GRATITUDE, AND ESTEEM
BY HER PUPILS AND FRIENDS

OCTOBER 6, 1887—OCTOBER 6, 1922



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ESSAYS AND STUDIES
IN HONOR OF
MARGARET BARCLAY WILSON

CHARACTER AND EDUCATION

THREE is a greater thing than book knowledge in the college curriculum.

We are marking an anniversary of thirty-five years of continuous service in that most beautiful occupation,—guiding the mind of youth.

It is not a tribute to “an unknown soldier,”—“whose very name,” as our President so finely said at the burial in Arlington, “whose very name took flight with his immortal soul,”—but it is to one who is very much alive.

Students learn reverence for man and his methods from their teachers. Writing has some effect on careers, but example and personal contact with a teacher have more to do with development of character through emulation. It is the character, bearing and deportment of the teacher, the dignified presentation of truths and facts, the charm of personality, that is remembered when book knowledge has faded. A teacher who does not assume absolute knowledge, but sympathizes with the student in her short-comings, has most respect from the scholar.

THE AMERICAN COAL-TAR CHEMICAL INDUSTRY

BEFORE the World War, the American coal-tar chemical industry was practically non-existent. Notwithstanding that the manufacture of coal-tar colors in the United States had been in existence nearly forty years, there were, in 1914, but seven small dye-manufacturing plants in the whole country. The American manufacture was confined almost entirely to the "assembling" into finished dyes of coal-tar intermediates imported from Europe, chiefly from Germany.

Contrast this dismal picture of national dependence with the *status quo* in 1920. The total number of firms engaged in the production of coal-tar products in 1920 was 213, while those engaged in the manufacture of dyes alone numbered 82. Three hundred and sixty separate dyes were being manufactured in 1920. Of these, 108 dyes, the output of which represented more than 90 per cent of the total production, were *each* manufactured by three or more firms. Thirty-five dyes representing over one half of the total quantity produced were *each* manufactured by seven or more firms.

Thus it is obvious that during the last seven years the United States has built up a dye and coal-tar chemical industry which, considering the short time, is an American industrial achievement of the first order. In

fact, it is an industrial achievement unparalleled in the whole of recorded history. Every true American, with the welfare of his country at heart, can take just pride in so remarkable an accomplishment.

So it may be said with truth that the American coal-tar chemical industry owes its being to the World War. When the efficiency of the British Navy effectually prevented German dyes from reaching our shores, American men of business and American men of science got together, raised the necessary capital, researched, developed, produced, improved their efficiencies, sold their goods and placed America where it belonged economically — free and independent.

Let us repeat. To-day America has eighty-two independent dye plants in eighteen states. We have 213 coal-tar chemical plants in 23 states. An understanding of the significance of this industry to the country as a whole necessitates that we review some elementary facts.

The story of the treasures hidden in a lump of coal has often been told. We all know that coke, gas, ammonia, and coal-tar are the primary products of coal distillation. The fascinating potentialities of the black sticky mess called coal-tar are also generally known. From this source, the chemist has wrested the most delicate perfumes, the most exquisite flavors, all the colors of the rainbow, explosives, poison gases, tanning materials, resinous compounds like bakelite, solvents, rubber accelerators, photographic developers, paints, roofing materials, road binders, disinfectants, motor spirits, and drugs to soothe and heal the sick.

The United States has the largest coal deposits in the world. Nature's lavish liberality in providing us with this basic raw material led us to squander it with the ruthless recklessness of a spendthrift. Before the World War, the greater part of our coke was made in the wasteful beehive ovens. In the quarter century preceding the World War, we threw away in tar and gas, reduced to coal equivalent, an amount equal to over 300,000,000 tons of coal, over \$400,000,000 worth of ammonia, and over \$500,000,000 worth of benzol products.

The demands of war electrified us into sane action, with the result that 60 per cent of the coke produced in the United States in 1920 was made in by-product ovens, thereby conserving, for the use of the industries just enumerated, ample quantities of the raw materials needed for the making of dyes, drugs, flavors, perfumes, and the other kindred final products of the coal-tar chemical industry.

Notwithstanding our great natural wealth in coal, the United States was slow to develop a coal-tar chemical industry. It is needless to dwell on the reasons for this. Aside from our own lack of interest, certainly the largest single factor was the German determination to dominate this field of industrial activity at any cost.

Then came the World War. And with it came the staggering realization that we Americans, with all our natural resources and industrial wealth, were impotent to prosecute war because, above all things, we lacked a coal-tar chemical industry. The German dye plants were indeed "potential arsenals" which they rapidly energized

into explosive factories and poison gas plants. But we Americans had neither plants nor tools, equipment nor experienced men. For a brief time, we groped in helplessness to build up in months what should have taken decades of daily thinking and effort.

How this chaotic situation was met is such recent history and the record is so plain that it is needless to repeat it. American chemists and engineers plunged into the solution of the problem with such energy and ability that eighteen months of concentrated effort found us ready to face the foe. Just as we reached a point at which we could hurl back at the enemy the terribly effective means of offense which he had thrown at us, the war ended.

We had lost much. But we had gained one thing of inestimable value. We had here in our own United States the beginning of a dye industry.

As these lines are being written, the United States Senate is debating the proper legislation to protect the American coal-tar chemical industry. We are now operating under a limited embargo which has worked with fair satisfaction for several years. Shall this system be continued or shall some other method be applied. Or shall we give up what we have gained entirely? Ridiculous as it may sound, the last named alternative is seriously advanced by seemingly thoughtful men and women. Why — ? Because the existence of a coal-tar chemical industry means the ability to wage chemical warfare. You do not get the argument? Neither do I, but some people seem to.

For chemical warfare is here to stay. You cannot legislate it out of existence. Any chemist can go into his garage, or his apartment kitchen, or his back lot, and experiment with chemicals which may yield poison gases.

We must have chemists, we must have chemicals and we must have inquiring human minds. And if we have chemicals and chemists and inquiring human minds — then we have potential war gases.

When all reasoning, argument, persuasion and rational attempts at solving international difficulties have failed, and two nations face each other, each with the desire to impose its will on the other, the result is warfare, and in waging war we may as well face the realities as they exist. These realities are that each side desires to kill and maim as many of the enemy as possible.

Certainly no sane man could accuse these United States of ours of a desire to dominate the world militaristically. All sane men and women hate war, Americans more than any others, probably. The costs of war are intolerable. The costs of preparation for war are equally intolerable.

We all want to disarm, but in disarming we also want to be sure that we are safe. We must be secure from outside invasion and attack. How can we combine disarmament with safety? Is it by building battleships at forty million dollars apiece, which are ready for the scrap heap a few years after they are built? No. Is it by piling up huge costs in armaments and munitions, shells, fortifications, and all the rest of the *passé* modes of warfare which existed before the World War took place? Again the answer is obviously no.

But there is a way in which we can have national safety and yet have very little expense, and very little, if any, temptation to use our means of defense for any other purpose.

The whole answer can be put in a single sentence — build up and maintain an independent, self-sufficient, self-sustaining American coal-tar chemical industry.

To one unacquainted with the facts, the question naturally suggests itself — why is this so? The answer is simplicity itself.

What do we need to build up this unique and highly complicated industry? We need materials. We need machinery. We need men. And we need money.

What do we need to wage a war of self-defense? Again, we need materials. We need machinery. We need men. And we need money.

But the thing which is not obvious, but which is true as truth itself, is that precisely the same materials, precisely the same machinery, precisely the same men, and precisely the same money are needed in making poison gases, explosives and the other materials needed in modern warfare, as are used in making the peace-time commodities turned out by the dye and related chemical industries.

Here is another question. Do you know that our whole American population of 110,000,000 people spends less money for dyes for all purposes in the course of a year than it takes to build two modern battleships? The American consumption of dyes in 1920¹ amounted to 60,000,000 pounds and these dyes were valued at approxi-

¹ Later statistics are not yet available.

mately \$1.00 per pound. So that \$60,000,000 would cover the total value of dyes consumed, and, as stated above, a thoroughly modern, up-to-date battleship costs in the neighborhood of \$40,000,000.

When you have your battleship, you have something which may, perhaps, sometime be of use, but the chances are that it will not. When you have your coal-tar chemical industry, you have something which not only gives us all the colors which make life sweeter, pleasanter and gayer, but you have factories that are making drugs to soothe and heal the sick, delightful flavors, perfumes, synthetic resins for phonograph records and telephone equipment, synthetic tanning materials, the basic materials for making paints, and a long line of variegated substances which it would take hours merely to catalogue.

There is another thing which needs to be remembered. This industry is produced by men, but do not let us forget that men are produced by the industry. The personnel of a highly technical plant such as a dye, perfume, or other synthetic organic chemical plant, cannot be produced in a day or a week or a month. It requires years of specialized training, years of patient thought, labor and application, and years of undivided attention to the translation of experimental research and development into the larger units of production.

And should war come, as war may, we have in every one of these plants a potential battleship, a land battleship, which has cost the public nothing and which stands there ready to be converted almost instantaneously into an arsenal for the general defense.

AMERICAN COAL-TAR CHEMICAL INDUSTRY '11

The coal-tar chemical industry must be protected, and *must* is the word we want to use. Those who have thought most about this subject are unanimously agreed that the limited embargo is the only satisfactory way of adequately protecting this industry.

Free-trade England diddled around for a year, very nearly lost her domestic industry, and finally came to this as the only solution possible. Italy, France and Japan have adopted similar measures. Is America to remain the only nation, along with China, to be the prey of the sordid and insidious German industry?

We Americans are at the crossroads. If we are going to be foolish enough to discard the tremendous accomplishments of the last few years, let us do so with our eyes as well as our mouths open. If not, and we believe we are not going to be so foolish, let us grant this industry the form of protection which it has legitimately earned by its energy, initiative, and possibility of use for the general welfare and the national defense.

FREDERICK E. BREITHUT

THE FEDERAL ORGANIZATION FOR EDUCATION

THE relations of the United States Government to education are unique. In no other first-class nation is there so little recognition by the central government of the important connections between education and other national concerns, and this in spite of the fact that popular education has probably had a more extensive development in the United States than in any other civilized land. The principal reason for the position of the United States Government with respect to education is undoubtedly to be found in those clauses of the Constitution which reserve to the states all powers not specifically conferred upon the federal government. For one hundred and thirty-five years education has been considered a function of the states and not of the national government. The national government has — in theory at least — no control of education in the states.

This fundamental provision in the organic law of the nation meets with almost universal approval. Practically no one wishes the federal government to exercise control over the educational affairs of the nation. But, on the other hand, professional educators and thoughtful citizens everywhere desire from the federal government service for the national educational system and recognition of the part that education necessarily plays in the

great complex of national interests. Neither adequate service nor appropriate recognition has been provided. The fight to secure them has lasted through three generations.

In response to the early pressures that were brought to bear on Congress, the United States Bureau of Education was established. This office was originally an independent department, but within a year it was reduced to the rank of a bureau and incorporated in the Department of the Interior. It was designed as an office for the collection and dissemination of information concerning the status and progress of education throughout the United States. For the most part it has fulfilled the functions assigned to it in the Act under which it was created. Naturally a large portion of its record of American education has been statistical. And gradually the Bureau has created a current statistical summary of American education that — in spite of all its defects — is unmatched in any country in the world. The Bureau's investigations of special problems in the field of education, furthermore, and its numerous monographs on important educational topics have had a considerable influence on the progress of education in different parts of the country. These activities doubtless constituted the only service that was absolutely required from the government during the latter part of the nineteenth century.

In the last twenty years, however, there has been a rapid change in the inter-relations of educational movements within the several states. Educationally the country has suddenly ceased to be parochial. Those in charge

aroused by these revelations. It has been almost unanimously agreed among them that some change in the government's position toward education must now take place. Just what this change is to be is still a matter on which agreement has not been reached. There is a prominent proposal which has received the endorsement of a considerable percentage of the teaching profession and also of many bodies of laymen. This has been embodied in two bills before Congress, one of which is now awaiting the action of that body. In brief it provides for the creation of a Department of Education with a secretary in the President's cabinet; for the transfer to that department of the Bureau of Education, and for decision by Congress as to what other boards or bureaus should also be transferred. It provides further for the appropriation by Congress annually of \$100,000,000 to be distributed to those states which make equal appropriations for the eradication of illiteracy, the Americanization of immigrants, the extension of physical training, the payment of teachers' salaries and the training of teachers.

But the measure has met opposition in the house of its friends. There are educational leaders who disapprove of both propositions which it includes. For the most part, however, the proposal that there should be a Department of Education is acceptable to the educational public. But there has been formidable opposition within the ranks of educators to the proposal for large government subsidies to be granted to the states on the dollar for dollar basis. This issue now constitutes the most serious cause for division between two important

groups of teachers and educational administrators. Undoubtedly it is also one of the most momentous matters of educational policy that has ever come before the school world. Nor does it concern education alone. Fundamental principles of government are also involved in the decision which must eventually be made.

Two considerations appear to be basic to the decision, namely — what do the educational systems of the country really need from the federal government and what kinds of service has the government proved that it can most effectively render in connection with other national undertakings similar to education.

Certain of the needs have already been alluded to. Now since there is a general agreement that the federal government should not operate the educational system of the country as it operates the Post Office Department; since practically no one believes that the long-standing relationship between the federal government and the states should be altered in the field of education, it follows that the educational system needs from the federal government the performance of only those functions and services which the states and similar governmental units cannot perform for themselves. In other words, there should be a reference upward to the national government of tasks that have definitely proved to be beyond the power of the states. Can certain of these functions and services be identified? As a matter of fact three are very conspicuous.

1. States cannot insure the consideration of education in the formation of general national policies. And education is not only one of the largest concerns of the nation

with respect to the capital and personnel devoted to it, but it is perhaps the most potent force both for molding national attitudes and for fostering national well-being.

2. States cannot gather information on a national scale and make those comprehensive studies of the national educational undertakings that are required to promote efficiency and guide the development of educational practice.

3. States cannot focus on national problems the best thought of the country and so furnish leadership in the determination of national educational policies.

These things certainly the states cannot do. And if they are to be done for the welfare of the nation it becomes the government's task to do them. No one surely knows whether there are other similarly important tasks which the states cannot perform. It is not certain, for instance, that states cannot or should not assume full financial responsibility for the support of education within their borders. That subject requires more exhaustive study than has yet been devoted to it. Since there is uncertainty here and with respect to several other undertakings with which some persons would charge the federal government, it would seem wise not to burden with them whatever federal agency is created.

The government has been carrying on a long and highly instructive series of experiments in dealing with the vital interests of the nation. A scrutiny of these is very helpful in determining what kinds of service federal agencies can best render in the field of education. The Government of the United States is engaged in two quite different kinds

of national service. The first is defensive or conservative, the second is creative. Under the defensive service of the government are properly grouped all those long-established activities relating to the raising of money, the provision for military defense, the administration of justice, the conduct of foreign affairs and postal communication. The agencies which the government has devised to carry on these activities are agencies of self-preservation. Within the spheres in which they operate they must control absolutely the lives, the property or the conduct of citizens, else the nation's safety is endangered. Back of these agencies has always lain the full physical force of the government.

The second kind of service, the creative service, is quite different in character. In it are included those activities designed to foster industrial production, to encourage scientific inquiry, to promote social welfare and to advance education. Very evidently the sanction behind the government's participation in these activities is not force. What is it? It is persuasion. This is proved by reviewing the history of any of the government establishments that deal with these creative interests.

Let us take two examples. The Department of Agriculture effected a revolution in the nation's basic industry in the short space of fifty years. How? By painstaking scientific investigations, by the dissemination of knowledge, by ideas, by publicity. In other words, by persuasion. The major part of the great development in agriculture, which is largely traceable to the Department of Agriculture, was wrought before the Department had

had conferred upon it any large executive powers and before it was in a position to dispense any considerable subsidies.

The Children's Bureau, with a much shorter history, has had a profound influence over the conditions of employment and the physical and intellectual welfare of children in all parts of the country. But until the present year the Children's Bureau had no powers and administered no subsidies. Its influence has been due to the accuracy of its studies of sociological conditions and the validity of the conclusions contained therein. In this case also the Bureau has ruled by persuasion.

Now both the Department of Agriculture and the Children's Bureau have recently had administrative responsibilities thrust upon them and have become the disbursing agents for large government grants. What the effect will be on the Children's Bureau it is still too early to determine. The effect on the Department of Agriculture of the administration of mandatory laws and huge government grants has already been deplorable. Its prestige has not been eclipsed, to be sure, but the Department is now beset by difficulties and antagonisms that bid fair to change entirely the relation toward it of the interest which it serves.

Certain obvious conclusions suggest themselves. The nation needs a new federal agency for dealing with its educational interests; an agency which will unify the government's own educational undertakings, which is equipped to carry forward studies on a large scale of the educational problems of the country and to furnish the

kind of leadership that is based on ascertained facts and ideas. The agency must represent a consolidation of bureaus and offices at Washington. It must be a larger, better supported, more influential establishment than any now devoted to education, an establishment that can command the service of the best minds in the country. Whether this establishment should be an independent department, a commission or a division of a department is of secondary importance—although most people have their preferences. Of primary importance is the assignment to it of only those functions which have in the past proved helpful to the creative interests of the nation.

S. P. CAPEN.

AN EPISTLE IN JUNE

DEAR DOCTOR:

(Best I like your title won
In those old days when most of us had none;
At that dark period when degrees were few,
We said "The Doctor," meaning always *you*.)
"Knee-deep in June," as Riley wrote, we stand.
The same green branches flaunt on every hand
As when our faded bricks wistaria wore,—
Long passed into a purple metaphor;
We breathe the same sweet breath of leaves and grass
While we sit slaving under midnight gas,
Dispensing marks with pencils blue and red,
Reaping sad harvest of the things we said;
And when all's done, the same bright wave of youth
Breaks in Commencement, leaving us, in sooth,
Flat as a sandstretch at the ebb of tide.
Dipsychus' demon slips up to the side
Of the tired teacher, with his whispered doubt:
"Now we're alone — what *was* it all about? "

Somehow, the very trick of such June weather
Evokes the ghosts of years we spent together;
The narrow room that topped the long stone stair,
The little circle grouped at noon tide there,

Faces long since dispersed, by Memory's power
Brought back, with all the humors of the hour;
Book-talk, and jests that lightened to and fro,
The give-and-take of thirty years ago;
And in the midst I see The Doctor sit,
The central source of wisdom and of wit.

In that old time of building, you and I
Laid the first course in walls now soaring high;
All our young passion of work is in those walls,
Set fast, cemented till the structure falls;
Part of the past your solid labors are,
And still you build, still looking toward a star.
We've seen the world change round us, as we wrought,
In manners, customs, standards, types of thought;
Art, verse, the drama, fiction, alter too;
And in new modes we serve a city new.
Yourself, your substance, generous still you give,
That this New Youth a lovelier life may live,
Spurred by the impulse evermore to share
What you have found of gracious, good, and fair.

So be it long! I know you love not rest.
But should at last the leisure hour seem best,—
As to your sometime comrade-oft it seems,—
Heaven grant you all fulfilment of your dreams:
Peace, freedom, friends, kind books that never fail,
Fresh roads to follow and new seas to sail.
I steal from Shakespeare's scrip a final grace:
“Thy own wish wish I thee in every place.”

HELEN GRAY CONE.

THE MEDICAL EDUCATION OF WOMEN IN THE UNITED STATES

THE following resolution was addressed to Elizabeth Blackwell by the Medical Class of Geneva Medical College, October 20, 1847:

RESOLVED: That one of the radical principles of a Republican Government is the universal education of both sexes; that to every branch of scientific education the door should be open equally to all; that the application of Elizabeth Blackwell to become a member of our class meets with our entire approbation.

“The history of the movement for introducing women into the full practice of the medical profession is one of the most interesting of modern times. The interest lies even less in what has been so far achieved, than in the opposition which has been encountered; in the nature of this opposition; in the pretexts on which it has been sustained, and in the reasonings, more or less disingenuous, by which it has claimed its justification. The history, therefore, is a record not more of fact, than of opinion, and the opinions expressed have often been so grave and solid in appearance, yet proved so frivolous and empty in view of the subsequent event, that their history is not unworthy careful consideration among that of other solemn follies of mankind.” (Mary Putnam Jacobi, M. D., Introduction to *Woman in Medicine*, 1891.)

When in 1776 the American Colonies became the United States of America, women were practicing medicine, many, apparently, with as good an educational background as men. At the opening of the War of the American Revolution, it was estimated that over three thousand five hundred men were practicing medicine in the Colonies, of whom only four hundred had received medical degrees.¹ The medical student was taught by a preceptor in the latter's office and while making visits to patients. An ambitious student received instruction from two or more preceptors. Then groups of students were taught by two or more preceptors who gave lectures in the office of one of the preceptors or in private rooms, thus forming miniature schools of medicine. There were but two good medical schools in the Colonies at the time of the Revolution, the University of Pennsylvania, organized in 1765, and the Medical Department of Kings College, New York, organized in 1767. The two schools together had bestowed a total number of fifty-one degrees of Doctor of Medicine before 1776. During the Revolution, the Medical Department of Kings College was closed to students.

Dissecting the human body was prohibited. Medical books were few and were imported. A few had been written and published by men who combined the offices of clergyman and physician. The first of such books, entitled *A Brief Guide in the Smallpox and Measles*, was written in 1677 by a Boston clergyman. The first medical book written by a physician, Dr. John Jones, 1775, was

¹ WALSH, *History of Medicine in New York*.

called *Precise Practical Remarks on the Treatment of Wounds and Fractures.*² There were two medical libraries, the Pennsylvania Hospital Library, 1762, which contained at the time of the Revolution two hundred and fifty volumes, and the New York Hospital Library, 1776. There were no medical journals published. There were four medical societies: Boston, 1775; New Jersey, 1760; Philadelphia, 1765; New York City, "about 1769."

One is not surprised to read that "quacks abounded,"³ both men and women. An ordinance was passed in New York City in 1716 to regulate the practice of medicine in the Colony of New York in 1760, and New Jersey passed such an ordinance in 1772.

The practice of obstetrics and the diseases of women was almost entirely the work of women. But three men were prominent as obstetricians. In 1762 lectures on obstetrics had been given to men in Philadelphia and opposition to "men midwives" had developed.

Such, briefly, was the condition of medicine and its practitioners at the opening of the War of the Revolution. During the war, women continued the practice of medicine. The men in the military hospitals were obtaining an experience which opened to them opportunities to study medicine on a large scale. As a result of this study, "there first breathed the spirit of medical science into the American profession."

² DR. JOHN S. BILLINGS, Chapter in *A Century of Medicine*, 1776-1876.

³ GARRISON, *History of Medicine*.

Into this new era of learning, women were not permitted to enter. From Boston came the observation: "It was one of the first fruits of improved medical education that females were excluded from practice; and this has only been effected by the united and persevering efforts of some of the most distinguished individuals of the profession."⁴ The women were excluded not only from the practice of general medicine, but also from that of midwifery. The exclusion of women, especially from obstetrics, created much opposition on the part of both men and women, and from this time began the long and not yet finished quest of women for the right to study medicine on equal terms with men.

Almost innumerable objections have been made to the study of medicine by women, but there seems never to have been a real reason advanced. The objections have varied but slightly from the time of the Revolution to the present day, and have been urged against admitting women to the study of medicine in the colleges, in the medical societies, in the dispensaries and in the hospitals. The mental incapacity of women for study has been dwelt upon less in this country than in others.⁵ Physical fitness has always been considered at great length. One would infer from the objectors on this point that no woman was ever physically fit to do a month's work in medicine. As if medical work required at all times more strength of body than is required in any other field of labor! The objection by "those high in the counsels of the Almighty"

⁴ DR. MARY PUTNAM JACOBI, "Women in Medicine," in *Woman's Work in America*.

⁵ JACOBI.

is to the effect that God never intended women to study or practice medicine.⁶ The rather fearsome assertion is made that women who study medicine would never want to marry. If, by chance, they did marry they would be unwilling to bear children, and that would be the end of everything. These objectors seemed to feel that every woman in the United States would insist upon studying medicine. A most awful objection was made by both men and women that the study of medicine would unsex the woman. Just what idea is intended to be conveyed by this is uncertain. It is said that the sensitive nature of woman would be so changed that she would become dead to the higher feelings of love and sympathy for humanity. As these are common to men as well as women, apparently the objectors fear that the study of medicine would not transform a woman into a man, but rather into a new and strange gender, neither masculine nor feminine. Elizabeth Blackwell and Mary Putnam Jacobi were told to dress in masculine attire and that then they could study medicine.⁷ Evidently the masculine dress would act as a preventive against the dreadful possibility of becoming unsexed. The fear of competition has been a constant argument against women in medicine. She "would presume to put her sickle into the harvest of others."⁷ To Elizabeth Blackwell it was said: "You cannot expect us to furnish you with a stick to break our heads with." From Boston came the objection in 1852:⁶ "Females are ambitious to dabble in medicine as in other

⁶ JACOBI.

⁷ H. J. MOZANS, *Woman in Science*.

matters with a view to reorganizing society." One gathers from this remark that society in 1852 was about right. Cardinal Gibbons in 1891, in speaking of well-trained women physicians, said: "I wish to emphasize as strongly as possible the moral influence of such a body, than which there could be no more potent factor in the moral regeneration of society."⁸ The real obstacle which makes it impossible for women to study medicine with equal opportunities with men is the fixed idea of the men of the utter impossibility of co-education. "It is obvious that we cannot instruct women as we do men in the science of medicine; we cannot carry them into the dissecting room and hospital" (Boston, 1820).⁹ "Co-education would not increase the dignity of men nor the modesty of women."¹⁰

The desire of women to study medicine never ceased, but no door would open for them, until in 1845 the heroic figure of Elizabeth Blackwell appears, stimulated by the words of a friend, "suffering of a painful disease," who told her that if she could have been treated by a lady doctor, she would have been spared her worst sufferings. Elizabeth Blackwell was told "that there were innumerable obstacles in the way of such a course," and that "the idea, though a valuable one, was impossible of execution." She needed, she writes, "an absorbing occupation, and the idea of winning a doctor's degree gradually assumed the aspect of a great moral struggle and the moral fight

⁸ CARDINAL GIBBONS, "The Opening of Johns Hopkins Medical School to Women," in the *Century Magazine*, February, 1891.

⁹ JACOBI.

possessed immense attraction for me." Then began the quest for a college willing to receive her. Finally, her friend, Dr. Warrington of Philadelphia, applied to the Geneva Medical School in New York.¹⁰ The faculty decided to submit the question to the judgment of the medical class (composed mostly of farmers' sons) with the condition that one negative vote would mean a refusal of the request.¹¹ It was later learned that the faculty was unanimously opposed to the admission of the woman, but did not wish to have the responsibility of refusing the Philadelphia physician. A meeting of the student-body was called which Dr. Stephen Smith, a member of the class, describes as "uproarious." When the question was put to vote, the whole class arose and apparently with one voice shouted "Aye!" A negative vote was called for. A faint "Nay" in a distant corner of the room was heard, at which the whole class arose, crying "throw him out!" Amid screams the young man was dragged to the platform, crying out: "Aye! Aye! I vote Aye!" A unanimous vote was thus obtained, and word of the result sent to the faculty. The student-body was composed of wild, lawless young men. Dr. Smith states that "It is quite impossible to magnify the power of the personality of Miss Blackwell over the lawless elements of that class." This influence continued to the end of her college course, January 23, 1849, when the degree of Doctor of Medicine was

¹⁰ DR. ELIZABETH BLACKWELL, *Pioneer Work in Opening the Medical Profession to Women.*

¹¹ ADDRESS OF DR. STEPHEN SMITH, Memorial Meeting, Dr. Elizabeth and Dr. Emily Blackwell, January, 1911.

given to Elizabeth Blackwell. The door had opened to allow one woman to enter and then closed to others, so great was the opposition to the study of medicine by women.

In the fall of 1847, Miss Harriet K. Hunt applied to Harvard Medical School for permission to attend lectures, and was promptly refused.¹² Again in 1850 she applied. The medical faculty approved, but the students objected. Three colored men had at the same time applied for admission, and at a meeting held by the students in December, 1850, regulations were passed "remonstrating against the amalgamation of sexes and races." In 1866 and in 1867, women again applied only to be refused. In 1868, women attended the lectures of one of the university lecturers, not a member of the faculty. "This was declared to be inconsistent with the rules," and the women were sent away. On April 8, 1878, the sum of ten thousand dollars was offered the Medical School if it would admit women on equal terms with men. The offer was given careful consideration but declined, the medical faculty voting 14 to 4, the overseers 17 to 7. "During the World War, permission was given to women to enter the Harvard Medical School who were registered at Radcliffe, provided ten qualified women applied. The regulation was passed late in the year and ten women did not apply. Since then they have not been admitted in any way."¹³ (April, 1922.)

¹² DR. JAMES R. CHADWICK, "The Study and Practice of Medicine by Women" in *International Review*, October, 1879.

¹³ LETTER from Assistant-Dean, Harvard University Medical School, April, 1922.

After the admission of Dr. Blackwell in 1845, the applications of women for entrance into the established colleges became more frequent and more insistent, and were continually refused. Not infrequently they were advised, rather curtly, "Get your own college." The first medical school for women was established in Boston, November 23, 1848, and was first called the "Female Medical Education Society," and later the "New England Medical College."¹² The school seems not to have been well managed. In 1874, it was merged with the School of Medicine of the Boston University. In 1850, the Female Medical College of Philadelphia was opened, and in 1867 the name was changed to the "Woman's Medical College of Pennsylvania."¹⁴ The idea of establishing this college originated from the suggestions of Dr. Fussell who asked, "Why should not women have the same opportunities in life as men?" The opposition to the College was long and bitter. Physicians who taught in the School or consulted with the women were threatened with expulsion from the Medical Societies. Their brethren refused to consult with them. "In 1853, the School adopted the longest course, five months, of any medical school then existing in the country." The College is now the only medical school open only to women. In 1853, the Penn Medical College of Philadelphia was opened in that city in opposition to the Woman's College. It was co-educational, is described as irregular, and was discontinued in 1864.

¹⁴ HISTORICAL OUTLINE, WOMAN'S MEDICAL COLLEGE OF PENNSYLVANIA.

Other colleges devoted exclusively to women had been opened in various parts of the country. Few colleges, not of the highest standard, were willing to admit women. It was a period in the history of medicine in the United States when to obtain a charter and open a medical school required little money and offered poor advantages. "Degrees are conferred with altogether too much ease, and it is unhappily true that the title of Dr. does not necessarily guarantee either good acquirements, good character or good sense" (1856).¹⁵

In 1854, a charter had been obtained by Dr. Elizabeth Blackwell for a dispensary and hospital in New York for the distinct purpose of giving practical bedside instruction to young women, an opportunity which they could nowhere else obtain. In 1865, the necessity of providing good opportunities for the study of medicine by women became an extremely important question. The Trustees of Dr. Blackwell's hospital, chartered as the New York Infirmary for Women and Children, considered the question from two points of view: First, the proposition "to establish scholarships for women in the College of Physicians and Surgeons, such scholarships to be endowed to the amount of two thousand dollars a year, the students to be selected with care and entered as beneficiaries of the Infirmary and to be withdrawn if they proved unworthy," or to establish a college for women in connection with the Infirmary.¹⁶ The questions were considered care-

¹⁵ DR. ELIZABETH BLACKWELL, *An appeal in behalf of the Medical Education of Women* (1856).

¹⁶ DR. ELIZABETH BLACKWELL, *Address Delivered at the Opening of the Woman's Medical College of the New York Infirmary*, November 2, 1868.

fully by the faculty of the College of Physicians and Surgeons. "The opinion was expressed that the only way to forward the most thorough medical education of women was to found a medical college in connection with the Infirmary and Dispensary with a standard equal to that of the best medical colleges for men." November 2, 1868, the college was opened. Four features were incorporated in the plan of instruction:

1. A three years' college course;
2. A larger proportion of time devoted to teaching and practical instruction than to lecturing;
3. A progressive succession of studies;
4. "The introduction of hygiene into our course as a prominent and obligatory study." (When this prospectus was put forth, no college in the country required such a course.)

A Board of Examiners was appointed consisting of the best medical men in the city, before whom each student appeared for final examination. This feature of the college antedated by several years the State Board of Examiners. The three years' course was not at first obligatory. The first class was graduated in 1870, the last in 1899. "The friends who established and have supported the Infirmary and its college have always regarded co-education as the final stage in the medical education of women."¹⁷ During several years the faculty had considered two methods for this accomplishment. First, "the affiliation of the separate woman's medical college

¹⁷ DR. EMILY BLACKWELL, *Address at the Closing of the Woman's Medical College*, May 25, 1899.

with a university." No university had however been willing to do this. The other proposition was "the admission of women to university schools on the same terms as men."

Co-education had come to the women in the Eastern States, in one of the best medical schools in the United States, the Johns Hopkins Medical School, in 1893. "From the outset, it was felt that a foundation like the Johns Hopkins Hospital would not fulfill its highest mission if the courses of instruction were not free to all, and they have been thus open from the beginning."¹⁸ It was not until Cornell University opened its Medical Department in New York City that the Trustees of the Infirmary College felt that a separate school of medicine for women was no longer required in New York. It had kept its ideal of providing a college for women equal in its standards to the best colleges for men. In fact its requirements had very often been a little in advance of those of men's colleges.

The possibility or impossibility of co-education in medicine was considered by the Board of Regents of the University of Michigan in 1870.¹⁹ The question was discussed at great length, one side stating that "Co-education would not increase the dignity of men nor the modesty of women." "The faculty would give a full course of medical instruction to females at any convenient time and place for a suitable compensation," or a separate

¹⁸ DR. WILLIAM OSLER, "The Opening of the Johns Hopkins Medical School to Women," in the *Century Magazine*, February, 1891.

¹⁹ "Memorial on Female Education," *University of Michigan Reports*, 1870.

female college in Ann Arbor or Detroit would be founded. Because men and women during the pioneer days labored together at the same tasks, quite naturally the girls and boys attended college together,²⁰ and, "under pressure of public sentiment against the wishes of most of the Professors," women were admitted in 1870.²¹

Johns Hopkins School must be co-educational under the conditions of its endowment. The charter of Cornell University is such that women must be admitted to the Medical School. The Medical School of the University of Pennsylvania (1765) admitted women in 1914 as regular students for the M.D. degree.²² On March 29, 1916, at the meeting of the Board of Permanent Officers of the Yale University School of Medicine, "it was voted to admit a limited number of qualified women, provided the necessary expenses for alterations of the buildings could be met."²³ The expenses were met, and, in September, 1916, two women were admitted. The College of Physicians and Surgeons of Columbia University admitted women in 1917. The number each year is limited to ten.²⁴

²⁰ Letter from JAMES B. ANGELL, "Education in the Western States," in *Woman's Work in America*.

²¹ Not until 1904 were women admitted on equal terms with men. (Letter from Secretary of Medical School, University of Michigan, April, 1922.)

²² Letter from the Dean of the Medical School of the University of Pennsylvania, April, 1922.

²³ Letter from the Dean of Yale University Medical Department, April, 1922.

²⁴ Letter from the Dean of the College of Physicians and Surgeons, Columbia University, April, 1922.

One hundred and forty-six years after the expulsion of women from the practice of medicine, women are able to obtain a medical college education on equal terms with men, except in Harvard University. Medical co-education in the colleges is no longer an experiment. Of Johns Hopkins Medical School, Dr. William H. Welch says: "The presence of women has lifted the tone not only of the students, but I may say also of the professors of the school."

Having obtained her diploma from the Geneva College, Dr. Elizabeth Blackwell writes, in 1851, that she had no medical companionship. The profession stood aloof. No medical society would admit her until in 1869 a Medical Library and Journal Association in New York City admitted her. The County and State societies were closed to women. These associations are the trade unions of medicine. It is extremely important that a physician become a member, not only for the companionship but for the opportunities which such societies offer for the continued study of medicine. In Massachusetts, year after year for twenty-five years, the women applied for membership only to be refused. The announcement of the successful entrance of women was noted in the Boston Medical and Surgical Journal, October 9, 1879, as follows: "We regret to be obliged to announce that at a meeting of the Councillors held October 1st, it was voted to admit women to the Massachusetts Medical Society." To the Philadelphia County Society, women first applied in 1858 and were admitted in 1888. Dr. Mary Putnam applied to the New York County Society in 1873 at the

suggestion of Dr. Jacobi, the President, "whom she married a few months later," and was admitted. Women are now admitted to all County Societies on equal terms with men. Kansas admitted women to the State Society in 1872. To the American Medical Association (the national association), women applied in 1870 and were admitted in 1876. Every State now admits women to its medical society.

As long as the individual practices medicine, the study of medicine continues. Dr. Blackwell in 1851 applied to a city dispensary for admission, and was told to get her own dispensary, which she did in 1854. Many dispensaries throughout the country are now open to women, some on equal terms with men. The necessity for the continued study of medicine and the closure of all hospitals to women caused Dr. Blackwell in 1857 to open the New York Infirmary in Bleecker Street, conducted by women for women and children, and for the practical instruction of the woman doctor. During the next twenty-five years, five hospitals were opened by women for the study of medicine by women. Now many hospitals throughout the Republic are open to the young interne for her first year after graduation. Few are open to the older women for the privilege of becoming attending physicians, and the same excuses are made that prohibited women from entering the colleges.

When in the course of human events the sons and daughters of Aesculapius study medicine with equal opportunities in college, dispensary and hospital, then will be written a most romantic chapter in the history of med-

icine in the United States, relating the story of the heroic women and the men who walked beside them to open the door to women of a great opportunity to serve those who suffer.

ANNIE STURGES DANIEL

COMPULSORY EDUCATION IN NEW YORK CITY

IN 1914, two bills were introduced in the Legislature, one amending the education law to except New York City from the requirement of maintaining a Permanent Census Board, and the other amending the charter of the City of New York by requiring the Board of Education to establish a Bureau of Compulsory Education, School Census, and Child Welfare and transferring to said bureau the duties and powers theretofore exercised by the Permanent Census Board, together with the staff and property of that board. These bills became laws: the first with the approval of the Governor only, and the second with that of the Mayor of the city as well.

Prior to the appointment of the director and the assistant director on June 24, 1914, the Board of Education adopted, as required by the statutes, by-laws organizing the bureau and providing for its control and development. The bureau is generally known as the Bureau of Attendance.

Since that time, continuation schools have been established by a State law and the attendance at these schools is looked after by the Bureau of Attendance. Later on, the issuance of employment certificates, formerly in the hands of the Board of Health, was delegated to the Board

of Education, and the issuance of these certificates was turned over to the Bureau of Attendance.

To carry out all these provisions of law, the bureau has 308 field workers and 109 clerks together with a director, an assistant director, and a chief attendance officer.

The law provides that the school census shall be amended from day to day, and this is as it should be, because an up-to-date census is fundamental to the enforcement of the compulsory education law.

THE SCHOOL CENSUS

Complying with the requirements of the School Census Law, the bureau does as follows:

1. Maintains the registration of children between 4 and 21 years of age and amends such registration from day to day, as required by law.
2. Verifies the statements of parents as to the enrollment of children in school, and places in school those children found not to be enrolled.
3. Issues census age certificates and certificates of identification when required.
4. Notifies, at or before the beginning of each school term, the parents of children who are of compulsory school age who are not receiving instruction or who will at any time during the school term following become of compulsory school age or privileged to attend school, of the obligation or privilege of such children to attend school, and the names and locations of schools at which attendance may be required or permitted.

5. Provides, through a carefully amended alphabetical file, the means of locating and identifying any child within the prescribed ages residing in the City of New York.

6. Establishes agreements with other cities, municipalities, and states, and with public and private institutions or agencies for supplying information of the prospective arrival within the City of New York or departure therefrom of children within the prescribed ages.

7. Compiles the statistics of the juvenile population by block or smallest unit of area for use in connection with the selection of school sites and buildings, the provision of playground and recreational activities and other related activities.

8. Prepares for definite areas or districts suitable studies of school enrollment by school, grade, sex, and age, and provides information for the most economical use of existing and added school facilities.

Our experience with the permanent school census shows that it is the only adequate basis for the enforcement of the compulsory education law. It identifies each child, keeps track of him, and locates him at all times.

It provides an accurate forecast of the number of children for whom instruction must be furnished each year and each day. It minimizes late entrance into school and consequent retardation.

It takes note of the shifting of population, as well as of its increases, and thus indicates in advance the need for new school activities.

If any given area is affected by immigration, increase or decrease, it registers the fact and the amount.

It provides a follow-up of employed children and thus enables the school authorities to list and compare the occupations of pupils with the character of instruction given them.

Its child population statistics are necessary for the development of recreational facilities.

COMPULSORY EDUCATION

As interpreting the requirements of the Compulsory Education Law, the bureau proceeds as follows:

1. It tries to raise the level of attendance in public, private, and parochial schools by reducing to the lowest possible minimum the amount of irregular attendance due to other than lawfully recognized causes.
2. It provides for the apprehension, arraignment, mental and physical examination, necessary treatment, and rehabilitation of the persistently irregular or habitually truant or delinquent child. This includes commitment, if necessary.
3. It selects from this group of children those whom defective physique, or mentality, or environment render incapable, temporarily or permanently, of response to the ordinary means of persuasion or correction.
4. It provides, through such agencies and individuals as are available, for the relief and help of those children who through poverty, accident, or other cause, lack the means of support necessary to their attendance at school.
5. It prosecutes through the courts (a) those persons in parental relation to such children as are truant or

irregular in attendance because of the neglect or failure of such parents to exercise a due measure of parental responsibility, or who, for the sake of gain or other selfish motives, wilfully and persistently refuse to comply with the law; (b) those children who are habitually truant or irregular in attendance or disorderly while in attendance and who have been adjudged beyond the control of their parents.

6. It advocates and assists in the establishment of special schools and classes, where needed, for children deprived of the facilities of public education because of physical disqualification.

7. It inspects and examines the rollbooks of schools.

CHILD LABOR

In addition, the enforcement of certain requirements of the Labor Law is laid upon the Bureau of Attendance, to wit:

1. To issue permits and badges to properly qualified children for

- (a) Carrying and distributing newspapers over a newspaper route.
- (b) Selling newspapers, magazines, or periodicals, after 6 A.M. and before 8 P.M., exclusive of school attendance.

2. To patrol the particular localities where newspapers, magazines, or periodicals are sold by boys.

3. To prosecute employers who employ children contrary to the provisions of the compulsory education law.

4. To secure the organized co-operation of all agencies and individuals interested or concerned with the regulation of street trading.

CHILD WELFARE

The child welfare section of the Law has been interpreted by the bureau as follows:

1. To make such investigations and prepare such reports and statistics as may be feasible concerning children whom the circumstances of environment tend to deprive of the training or physical development contemplated by the compulsory education law.
2. To endeavor to obtain material aid, personal care, or other suitable attention for the families of children or the children themselves, the lack of which causes irregular attendance, delinquency, or destitution.
3. To develop and carry out a definite plan for the provision of such relief with the organized charitable philanthropic organizations.
4. To co-operate fully with the Children's Court for the control of juvenile delinquency.
5. To make investigations in connection with vocational guidance and to aid in the development of a program for vocational guidance.
6. To follow up all cases of mature girls discharged from school and to prevent their withdrawal by unlawful means or without the knowledge and consent of their parents.
7. To locate and report to the proper authorities places

of resort of truants and absentees from schools, where irregular attendance is accompanied by idleness and other objectionable or improper practices.

From this *résumé* of the Bureau of Compulsory Education, School Census, and Child Welfare, it will be seen that the bureau is dealing with a social problem as well as an educational one. The attendance officers are of a high type and strive to put themselves in the place of the boy or girl whom they are studying. They know his family, his environment, and his reactions, and in case they are not able to solve the problem individually but need the help of some one versed in psychology or medicine, this is readily obtainable.

The point is that the pupil must be studied as an entity and every available means tried to change him from an anti-social attitude to one in harmony with his surroundings, thus making him better fitted for good citizenship.

The following is a report on the work of the Bureau of Attendance for the school year from September 1, 1920, to June 30, 1921.

Number of cases received and closed.....	608,591
Number of hearings held.....	17,818
Number of court cases.....	3,583
Amount of fines imposed.....	\$4,605
Number of commitments:	
By Director of Bureau.....	579
By Children's Court.....	64
On account of violation of parole.....	<u>280</u> 923
Newsboy permits issued.....	1,830

JOHN W. DAVIS

SOCIAL AND OTHER STUDIES

THE term Social Studies, while it has been in common use by the National Educational Association and some other organizations for at least a decade, is still rather new, and is consequently not well known to the exoteric. In fact most of what is connoted by this term is still generally referred to, even in some educational circles, as History and Civics.

The Social Studies include those elements of history, economics, political science, sociology, geography, and possibly psychology, ethics, anthropology, ethnology, etc., which may be used in the organization of school curricula. The unifying element in the field of study and teaching is the fact that the Social Studies deal with such contributions as scholars can make to the knowledge of man as a gregarious animal working with his fellows for the common good.

The expression may be made clearer by a reference to the developing organization of the curriculum of the secondary schools. It is becoming more and more widely recognized that the studies in the secondary schools must be organized in groups for purposes of clear thinking on the problems of efficient organization. Some curriculum-makers are advocating a six-unit system composed, for example, of English, foreign languages, mathematics, science, practical arts, and social studies. Others would

make a seven-unit system and others would use somewhat different principles of grouping. The basic idea is that every pupil should become somewhat facile in the use of his mother tongue; secure some of the educational value to be derived from the study of a language other than his own; receive some of the training and development derivable from the study of mathematics; be led to grasp the meaning of modern science; be introduced to some of the practical arts; and devote some time and effort to the Social Studies. This classification, through the process of elimination, serves to clear up to some extent the notion here under discussion by indicating what the Social Studies do not include.

A distinguished university professor of economics, who has given a large amount of attention to the Social Studies in secondary education, because he believes that the pursuit of the study of society in the institutions of higher learning is conditioned by a more thorough development of the Social Studies in the secondary schools, was recently quoted as making the following incisive statement about the Social Studies:

“The organization of the Social Studies in the public schools should be in terms of the purpose of introducing those studies. Their purpose is that of giving our youth an awareness of what it means to live together in organized society, an appreciation of how we do live together, and an understanding of the conditions precedent to living together well, to the end that our youth may develop those ideals, abilities and tendencies which are essential to effective participation in our society.”

There are not a few leading educators who hold that the relation of the Social Studies to the organization of

the schools is not a problem of getting these studies into the curriculum, but one of organizing the curriculum around the Social Studies, making them in reality the core and determining principle of the entire work of education. If the basic thought which runs through the above quotation is sound, then this notion that the Social Studies should be the core of education can hardly be successfully attacked. Man and his activities are determined largely if not wholly by motives. Science and language and practical arts are implements to be used by man as directed by his motives. Ethics, one of the basic contributing agents to the Social Studies, goes back to the examination of the ultimate motives. Civics concerns itself with the nearer and more practical, and it concerns itself more particularly with the social motives. It is not infrequently said that ethics refers to the individual motives and civics to the collective motives. The Social Studies deal with all of the ramifications of the problem of relating motives to action in organized society. Therefore it seems that these Social Studies should very properly be carefully examined to determine whether or not they should constitute the unifying element in education.

A large part of education is concerned with the effort to hand down to the next generation what earlier generations have handed down to us in so far as we have found, on careful examination, that this heritage cannot be improved through addition or elimination. In recent centuries science has been adding to our heritage much both of knowledge and clarity of thought. Much barbarous super-

stition has been eliminated; much of the encrusted ignorance and intolerance bequeathed by the sad conditions of savagery has been broken away and man has been liberated. This liberation possibly reached its climax in the time of the French Revolution if by liberation we mean the freeing of the individual from all the trammels of tradition and convention. Some of the wisest of our fellow workers now believe that this liberation of the individual went too fast and that the reorganization of the group should have gone with it. The study of this reorganization of the group on the basis of the experience of the world called history is the task of the Social Studies. The handing down to the next generation the best we have of knowledge on the subject of co-operation and the best we have of training for the use of this knowledge is the task of the teacher of the Social Studies.

In primitive times the patriarch or ancient gathered his people about him and recited the deeds of the family or clan. The medicine man or priest passed on the taboo and other warnings against the dangers which infested the path of individual and group. They were primitive teachers handing on the torch of knowledge. Only by their ministrations was "history" started and elementary knowledge sent on its journey down the ages. Now the printed book replaces tradition and the trained teacher takes the place of the elder, but the function is of ever growing importance.

One of the difficulties which has stood in the way of the wisest development of the Social Studies has grown out of the fact that the university scholars who have to do

with the development of the study of history, economics, political science, sociology, geography, etc., have not been familiar with school conditions and therefore have in many cases not been able to contribute to effective work in the schools. There has been a tendency for the university scholars to think of the schools in terms of university study and so they have encouraged the pushing of narrow departmental teaching down into the schools where it is even more dangerous than it is in the college.

Another difficulty has grown out of a failure of educational experts to recognize what contributions university scholarship may make in this, as in other fields of teaching. Many university departments of education where school teachers are trained, have carried on their work as if they thought a person could teach in the secondary schools a subject which he does not know, if only he has had some training in the psychology of children. This training in the nature of the child's mind is of course a condition precedent to the best teaching, but it is a condition precedent only in so far as it is a means of enabling the teacher to teach what he knows. It is a means of facilitating teaching; it does not supply the teacher with his most important equipment.

While the scholars and the educational theorists (using the latter term in the best sense and with no uncomplimentary connotation) have been working more or less at cross purposes, many high school principals and principals of private secondary schools have been assigning the Social Studies to teachers who were wholly untrained either in content or in method of instruction. With this neglect on

the part of the responsible authorities, the Social Studies have in many places lain fallow while a sort of formal thing called history and a little civics have been taught in dry-as-dust exercises. It may be that this sad condition is not more characteristic of the Social Studies than of work in other subjects. But it is more conspicuous when one considers the enormous service the Social Studies could render to this bewildered world if only work in them were effectively organized. Furthermore it will be disputed by no one with even the most superficial knowledge of the present practice in the schools that those who teach Latin or geometry are expected to have a little more preparation than those who teach history. While this a fact, it is also known, though to a smaller circle of the better trained, that the teaching of a subject such as history is far more difficult than the teaching of mathematics or language, though it may not be more difficult than real teaching of literature.

Light seems now to be breaking on the leaders among the workers in the Social Studies and in those aspects of education closely related to the development of this field. The hope which is said to spring eternal in the human breast seems to have a good foundation for rational expectation that within the next few decades the preparation of the young for life in a democratically organized world will be more carefully organized and more effective than it has ever been before.

An organization called the National Council for the Social Studies has been organized. It is made up of historians, economists, political scientists, sociologists, geog-

raphers, and other scholars; school administrators, teachers, and students of the science of education. The officers of this organization are among the leaders in their respective fields, and they seem to be actuated by something almost akin to the crusader's devotion.

The purpose of this organization is to bring about such co-operation among the groups, which are able to contribute to efficiency in this field, as will tend to eliminate lost motion, duplication of effort, cross purposes and friction. If this purpose is achieved there can be no doubt that a movement forward will be inaugurated which will be irresistible to the force of ignorance and obstruction.

The organization proposes to do two things at once. The first is to discover and list for purposes of correspondence those teachers and others whose life interest is the teaching of the Social Studies. There are many of these working in large and small communities toiling often under the most distressing hardships and discouragement, conditions which make their efforts almost useless.

The second is to list and describe all of the leading experimental efforts looking to the development of the Social Studies. This list will, through its explanatory annotations, bring out the common elements in these experiments and thus isolate and make conspicuous those differences of opinion which need incisive discussion. Frank discussion and criticism will then follow as a natural thing; and the elimination of conflicting views will also follow as a natural consequence of the discussion. One of the bases on which must always rest real argument for democracy is the fact that the human mind is naturally fair and

reasonable; and that the full and dispassionate discussion of any subject will in the end bring the light which all sane minds can see and approve.

Such a program does not look to anything like a bureaucratically standardized system of education for a kind of pseudo-democracy that having become fixed is dead. It looks to a condition in which well trained teachers will teach as they wish and will organize their work in the light of the local conditions that confront them; but they will be trained in the truth and the truth is one. They will be trained in methods of adapting the truth to conditions which are as different as are the leaves in the forest. They will be professional persons in the sense that their lives will be devoted to a purpose for the pursuit of which purpose they have given themselves adequate preparation and for the attainment of which they are willing to maintain an unflagging campaign of readjustment in the light of developing knowledge about a constantly changing world.

But all this work in the Social Studies is conditioned for its success on accompanying work in providing the sound body in which the sane spirit and clear mind may live.

There are those who, after reading a biologist such as Professor Edwin G. Conklin, are likely to infer that human evolution has reached its highest stage, and that therefore we have nothing finer than our present society to hope for. I fell into such a trap when I read one of his lectures and wrote to ask him whether he meant to encourage any such attitude. My error was due to my gross ignorance of biology and he soon set me right by saying,

as I remember it without a written record, that he believed that human society is only on the first rounds of the ladder of its evolution. He seems to believe that with a proper teaching of organized co-operation in the light of constantly developing scientific knowledge of human psychology, a future society may be hoped for which might realize many of the long-harbored dreams of the millennium.

It thus appears that the human animal is only just entering "modern history," only beginning to study the way men can live together in peace and mutual helpfulness. The many will be born and work through dull discouraged lives and die; but the few to whom Providence has given that disturbing vision of the possible which characterizes poets and philosophers will continue to scan the horizon for the promised land with the confidence that "the best is yet to be, the last of life for which the first was made."

Human Society, guided by ideals, served by science, will continue to grow until civilization is attained,— a condition in which intelligent people will live civilly together in wholesome contented communities. If this dream comes true the physiologist with the psychologist will be the creators and the builders.

EDGAR DAWSON

SCHOOLS AND TEACHERS

Consisting of certain rambling remarks, more or less autobiographic, by a veteran schoolmaster.

AS I came out of my front door this morning, carrying a portfolio under my arm, a group of little children came dancing toward me on their way to school. One of them looked up and said: "Say, Mister, are you too going to school?" I answered: "Of course, Bright Eyes. I have been going to school for seventy years, and hope to go forever." They stopped, seemed to eye me with wondering amusement, and then we walked down the street together, laughing and chatting as we went.

Having studied in many schools, having had many teachers, having myself been a teacher, having been a Trustee in many institutions of learning, having been the Chancellor for a decade of one of the largest universities in America, and the Director for two decades, or more, of one of the largest Museums in the land, it has occurred to me that perhaps I have the right to say a few things about schools and teachers, without exposing myself to the charge of immodesty in approaching this very sacred theme.

In its lowest aspect teaching is the communication of knowledge to others.

In a certain sense the world is what its teachers have made it to be.

The various civilizations, which exist to-day in different parts of the globe, are fundamentally inheritances from the past. Whatever culture exists anywhere is based upon old knowledge transmitted from former generations to the present. Upon the foundation of old knowledge new knowledge is being slowly built. The process goes on, however, somewhat unequally. Coupled with learning there is forgetting. Ascertained facts are not always recorded. There were arts, which have been lost. It is true, nevertheless, that the power possessed by different nations and tribes has come to them through teaching. The native of the Congo owes what skill in the arts and crafts he has to what he has learned from those who went before him. The same is true of the most highly cultivated citizen of Great Britain or the United States. Some peoples have inherited but little knowledge; other races have inherited more; some a great deal. The so-called "backward races" have had limited schooling; the so-called "advanced races" have had higher advantages in the way of instruction. I will not enter into the question of the relative cerebral capacity of the races from the standpoint of the anatomist and physiologist, though that is a tempting theme. I have held the Piltdown skull in my hands, and have talked about it, with my friend Dr. Arthur Smith-Woodward at my side. As Rudyard Kipling says, "That is another story."

Instruction comes to men in many different ways. There is an old Welsh triad which says: "The three pillars of learning are *seeing much*, *reading much*, and *suffering much*."

One of the greatest teachers is Nature. We can only learn from her by observation. Many of the backward races seem to have had no other teacher than Nature. Observation of things and oral tradition have been the sources whence they have imbibed knowledge. They do not always appear to have drunk deeply or wisely from these two well-heads. Nevertheless it is at times surprising to the student to discover how much the backward races really do know about things within their horizons. The Indians of South America and the peoples of the African hinterlands sometimes awaken astonishment by their nice powers of discrimination, when it comes to distinguishing plants, insects, birds, mammals, and their habits. There is a vast store of interesting lore stowed away under the unkempt pates of some people whom we call savages.

Savages are not the only students of Nature. All of the achievements of our boasted modern science have been based upon hints given by Nature. Joseph Henry found the mercury, which he had put into a bowl, spilled upon the shelf. The cabinet had been locked. He had the key in his pocket. The bowl was empty. He noticed that a piece of lead, having a ^-shape, was standing with one end in the bottom of the bowl, the other outside upon the shelf. He came to the conclusion that the mercury must have escaped from the bowl through the lead, which had acted as a syphon. From that hint sprang up a whole body of treatises upon the porosity and conductivity of bodies before that time called solid and thought to be impermeable. Alexander Graham Bell, when he was a

boy, had used two tin cans without bottoms with parchment stretched tightly over their open tops, like a drum-head, and a string drawn taut from drum-head to drum-head to transmit sound for a long distance. This device was often used as a sort of toy when I was a boy. I rigged up one when I was a lad of ten, and I used it to communicate with one of my playmates, who lived "around the corner." Other lads in the village had them. Dr. Bell, who was experimenting to find out how to convey sounds to deaf ears, hit upon the idea of substituting an electrified wire for the string, and behold the foundations for the telephone were laid. We know to-day that not even a wire is needed, but that the wonderful somewhat, which we call the "ether," which fills all space, and which is infinite and eternal, will transmit waves of sound when transformed by the "radio-process." Last night, seated in my home in Pittsburgh, I heard a concert which was being given four hundred miles away, and enjoyed it.

Books are teachers.

If Solomon could say "Of making many books there is no end," what must be said to-day? My little library is greater than that which was possessed by any king or emperor in the days of Greek and Roman glory. Charlemagne is said to have had a library, which was the wonder of his time, although he could neither read nor write. It consisted of eight hundred volumes. I own many thousands of books, and I work under the roof of a great building, in which there are nearly half a million of books; books in many languages, and upon every conceivable subject. The accumulated wisdom of the ages is at my

right hand, and I hold the key. The best part of an education is to know what book to consult, when you wish to ascertain an opinion, or a fact.

Some men have had no other teachers than books. Such men have not always been "bookish." I dislike mere "book-worms," who read everlastingily and put their winnings to no good use. If a man has chosen rightly and has mastered only one book, he may be in his field a very formidable antagonist. "Beware of the man of *one book!*" That is an old saying.

Experience is a great teacher.

We learn much by the simple act of living in contact with our fellow men or with Nature. The lessons of experience are often hard. Happy the man who has the wisdom to learn from the experience of others! The boy, who has seen a comrade fracture his skull against a stone-wall, should not after that, in order to prove to himself that stone-walls are dangerous, butt his own head against a wall.

In the end the best teachers are men and women. An old teacher of mine used to say: "The highest education is not derived from books, but from contact with men, *big men.*"

The qualifications of a great teacher of the human sort are a finely cultivated and richly stored mind, high principles, and the power not merely of imparting knowledge in a gracious and winning way, but of arousing enthusiasm.

The teachings of the home have been largely determinative of the careers of multitudes of men and women.

I may say personally that in my own little life I owe an unspeakable debt to my father, who was a man of learning, and to my mother, who was an accomplished musician, a painter, and possessed of great literary taste. My father taught me the scientific names of plants and animals at the same time that he taught me their English names. When I was a boy of eight I knew that White Clover is *Trifolium repens*, that the name of the blue-bird is *Sialia sialis*, and so on in hundreds of cases. When I went to college, botany was "a cinch." I was taught to read and speak German in my infancy, and a little later French. German was the language my parents used in speaking of confidential matters, when they did not wish "the children" to understand, and we children were therefore quick to acquire a knowledge of it. I never had wiser, kinder, or more capable teachers than my father and mother. Every memory of them is blessed.

Later on I had many tutors. I attended many schools, from one of which I was happily expelled for playing pranks, and helping to give the master "a licking" for cruelly beating his dog in the presence of the school. I was confided to the care of a private tutor, reputed to be the most learned man in western North Carolina. He was an invalid and had only four pupils. He was a great scholar, and a great saint. We four boys loved him, and he filled us with a passion for study. I studied in two colleges, graduating from the first when I was seventeen, and from the second when I was twenty. During my senior year at Amherst my chum was Neesima, the first Japanese educated in America, who helped to make "the

new Japan." I taught him Greek so that he might read the New Testament in the original; and he taught me some Japanese, which came into good use in later years, when I was the Naturalist of the U. S. Eclipse Expedition to Japan in 1887. After graduation I became a teacher, and a month after my twenty-first birthday entered upon the duties of the Principalship of the High School at Amherst, and the next year served as the Principal of the High School at Westboro, Massachusetts. *In docendo discimus.* My pupils taught me a great deal. Then I went to Princeton. For three years I studied Hebrew, Chaldee, and Arabic under Dr. William Henry Green, a great man; and theology under Dr. Charles W. Hodge, the grandson of Benjamin Franklin.

Since my last graduation I have been studying harder than I ever did in school, college or seminary. Thousands of men and women have been teaching me. I have learned much from Christian clergymen of many denominations, from Jewish rabbis, from Buddhist abbots in the orient, and mollahs in Morocco. I have mingled freely with professors and presidents of colleges and universities. I have stood on terms of intimacy with many of the most distinguished men of science in the past and the present generation; I have numbered among my instructors many of the leading men in manufactures, commerce, and finance. I have picked up a few things worth knowing from kings, queens, emperors, and presidents, whom I have learned to know, and with whom I have conversed. I have learned a lot from seamen and soldiers. I have had as occasional instructors coolies, thieves, and vagabonds. "Bill" Quan-

trell, the son of the master of the first school I ever attended, taught me to make "cats-cradles." He was much older than I. He was shot in Kentucky in 1864, after he had perpetrated the infamous Lawrence Massacre. He died with his boots on. My mother once spanked me for playing with him. He was the "bad boy" of the village, when I knew him, and inherently cruel in his instincts.

As I look back over the three-score and ten years, during which I have been going to school, I can recall many teachers I disliked, some whom I adored. None stand out in memory more clearly than Julius Hawley Seelye and Dr. Charles H. Hitchcock, both of Amherst. The former taught me to think straight and concentratedly; the latter not to be afraid of the face of man. The former was a second father to me; the latter I learned to honor for his transparent truthfulness and engaging frankness. Many a time I went to "Old Doc.," as we affectionately called him, to ask a question, and it was refreshing as morning breezes to hear him say: "I don't know; and there is no gentleman in the Faculty who knows."

This leads me to observe that education does not consist, after all, so much in the impartation of knowledge, as in the awakening in the soul of a consciousness of its latent power, and of a sense of the inevitable limitations of human nature. A truly great teacher is the one who quickens his pupil to make the best of himself, who trains him to love the service of his fellow men, and to walk reverently and humbly in the presence of the infinite mysteries which are wrapped about all of human life.

W. J. HOLLAND

MEMORIES OF THE FOOD SITUATION IN 1918

INTERNATIONAL accord is most bravely illustrated by the fact that for over a hundred years armed Americans and Canadians have freely crossed and recrossed a frontier three thousand miles long for the purpose of killing bear, moose, and caribou. During the Great War all kinds of commissions arose for the reconciliation of differences between the Allies. These commissions gave common information of mutual interest and brought about an even-handed distribution of assets. National ignorance or selfishness, when exposed by open argument, frequently retired and hid itself ashamed. Often these commissions exercised almost sovereign rights, as did the Shipping Board in its control of the merchant marine of all the Allies. To produce international harmony and amity sovereign rights must be sacrificed; they must be subject to reasoned control. Every American should ask himself whether, if a demand by Washington upon Mexico to salute the American flag were adjudged wrong by an international commission appointed by France, Italy, and Great Britain, he would bind himself to accept that judgment or whether he would lightly prefer the arbitrament of war. The great Disarmament Congress at Washington shows clearly what may be accomplished when nations

which are mutually suspicious come together around a table.

The only interallied commission of purely scientific character was the Interallied Scientific Food Commission. As members of this commission, Professor Russell H. Chittenden, of Yale, and I were in Europe from March to June, 1918. The situation of England was more precarious than that of any other country, for England before the war had grown only one-third enough food to support her great industrial population. Her ships were being sunk by submarines and many more were limping lamely back for repairs after encounters with these vessels. England needed above all bread grains, and these were largely imported to take the place of meat, butter, and sugar, which were to be had in very limited amounts. Now it happened that just at this time the United States had suffered from two successive poor years of wheat production. The carry-over of surplus wheat had been used the year before, and the wheat crop of 1917-1918 was only just enough to feed our own people. In the face of this Britain was demanding more wheat than she had ever previously consumed. From the viewpoint of a detached observer in Washington this evidently was an instance of English gluttony and greed, and I heard it so stated.

It is well known that at this time Americans began to eat corn bread, even as our ancestors had consumed it. Many southern states patriotically passed laws forbidding the consumption of wheat. Through such measures nearly a quarter of our wheat crop was exported to Europe as fuel for the human beings engaged in battle, in munitions

making, or for the nutrition of the little children who were to be the bearers of civilization following the war. Before leaving for England I called on my friend, Dr. Margaret B. Wilson, who had been "over there" a few months before. She told me how she had instructed the Lyons restaurant, the London counterpart of our Childs' restaurant, in the art of making corn bread, and I found later evidence of this work, for in the windows of their shops corn bread of fair quality was exhibited for sale. There are three reasons why corn bread was not taken in greater quantity as food by the English. In the first place, corn is more perishable than wheat in its shipment across the sea. Secondly, the English do not know how to make corn bread. I remember some atrocious material served to us as a delicate attention on one occasion. Thirdly, the English do not like it. They associate the material exclusively with the diet of pigs. They recalled a time during the war when their bread was mixed with it, was yellow, and entirely distasteful. To an American this might seem a selfish attribute in English character, whereas it really belongs in the category of national psychology towards food. Mr. Hoover could not induce starving Belgians to eat rice. A Frenchmen would die rather than eat oatmeal. The Italian thrives on corn in the form of *polenta*. The Englishman is devoted to his Yorkshire hog, whereas the Italian is happy only when surfeited with rice or macaroni.

Appreciation of people living in a foreign land comes through contact with them, through knowledge of their conventions, and not through an application of one's own

standards to them. For example, we in America had an enormous crop of corn at the time of our poor wheat harvest. We were told when we reached London that we should stop feeding corn to pigs, and even that we should ration corn in the United States. This advice came from eminent, but uninstructed, sources. We were able to point out that it would be as ludicrous to ration corn in the Middle West as it would be to ration the fish of the sea upon which the British were so largely depending for animal food. They had no idea of the fabulous reserve of animal fodder which lies in our annual corn crop.

The scientific men of the Royal Society of London had accomplished a very notable amount of work before we arrived. Through their activity a Ministry of Food had been upset and a more intelligent administration established in its stead. We reached London at the time of the introduction of the rationing system, when the scanty supplies of meat, sugar, and margarine were divided equally among the people, rich and poor alike, and at low prices. The week before 500,000 people had stood daily in long lines waiting to get into the butcher shops, a condition highly dangerous to popular contentment. After two weeks of rationing the queues disappeared from the streets because each family knew that it would be provided for.

Our mission was in part to endeavor to reduce the food demanded of the United States to a minimum, and it could not therefore become highly popular. Indeed, the presentation of the scheme produced resentment. Professor Gowland Hopkins truly expressed British opinion

when he wrote me the day after a talk given before the Royal Society: "I hope you will understand that we have been a little nervous lest that, with low rationing, the productiveness and general conduct of the industrial workers in this country might suffer deterioration. I do hope that you will believe, at the same time, that when the necessity is shown, everybody in this country will cheerfully come into line and make what is available suffice."

As a whole, industrial England was never so well nourished. The per capita consumption of bread grains was 530 gm., which contained 1400 calories or 55 per cent of the total food requirement. This contrasted with a pre-war consumption of only 30 per cent in the form of bread. The decreased consumption of meat by 60 per cent, and of fat and sugar by 50 per cent each, was automatically provided for by a compensatory increase in the bread consumption. Thus, Professor Noël Paton wrote: "The advantages of having an elastic reserve of unrationed bread-stuffs to allow the diverse energy requirements of different individuals to be supplied, has been argued in a series of 'Memoranda by the Food Committee.'" And Professor W. B. Hardy, secretary of the Royal Society, stated the matter concisely, "Bread is not of itself sufficiently attractive to lead to consumption in excess of real appetite."

The whole British attitude was one of reason and common sense.

When we arrived in Paris to hold the first session of the commission we found a very fixed determination on the part of the British delegation not to yield to the suggestion of a possible cut in the calculated food supply. After

a heated discussion the following resolutions were unanimously adopted by the representatives of the United Kingdom, France, Italy, Belgium, and the United States:

"That the requirements of the average man of 70 kilograms body weight doing 8 hours average physical work in a climate such as England's or France's is to be considered as 3,300 calories *as purchased*.

"That the Commission recognizes that in case it becomes impossible to furnish this ration, a 10 per cent reduction could be borne for some time without injury to health."

It was decided that 3,000 available calories *as ingested* were the requirement of the *average man*, thus leaving a 10 per cent margin for spoilage or domestic waste. An average man would therefore require about 1,100,000 utilizable calories per annum.

To determine the energy requirements of a nation of men, women, and children it was necessary to fix the relative quantities of food taken by the various elements of the population. What are known in England as Lusk's coefficients were adopted and are as follows:

Age	Coefficients	Utilizable calories
0-6 (both sexes).....	0.50	1500
6-10 (both sexes).....	0.70	2100
10-14 (both sexes).....	0.83	2500
14 + (males).....	1.00	3000
14 + (females).....	0.83	2500

These figures allowed larger quantities of food to children than older authorities had thought necessary and were based on the scientific work of several American investigators. Thus, it had been found by DuBois that boys of fourteen had as great a basal heat production as their fathers. Only recently (1921) Benedict has demonstrated the fact that the quiet resting heat production (basal metabolism) of girls does not vary greatly from 1250 calories daily between the ages of twelve and seventeen years. This justifies the statement made in 1917 that girls require the same quantity of food as their mothers. The height of women averages 4 inches below the height of men, and their basal metabolism per unit of size is 7 per cent less, as DuBois has shown. They usually engage in less arduous physical work than do men, hence their lower nutritive coefficient.

The energy requirements of a population, such as that of the United Kingdom, could now be calculated, as appears in the following table:

ESTIMATE OF THE CALORIC REQUIREMENTS *Per Diem* OF THE
POPULATION OF THE UNITED KINGDOM IN 1911

Age in years	Number	Calories per person	Man value	Calories in 1000 millions. per diem	Per cent
0-5.....	5,772,000	1500	0.50	8,660	8
6-9.....	3,709,000	2100	0.70	7,790	7
10-13.....	3,548,000	2500	0.83	8,870	8
14+ (males..)	15,437,000	3000	1.00	46,311	40
14+ (females)	16,808,000	2500	0.83	42,020	37
	45,274,000	2510	0.836	113,651	100

This table shows that in a community where a *man* is allowed 3000 calories the average allowance of all the inhabitants would be 2510 calories or 0.836 of the man's ration. If, therefore, one multiplies the population by its "man value" of 0.836 and then by 3000 calories, one can calculate its caloric needs. That the average inhabitant, from a nutritional standpoint, is approximately equal to 0.83 of a "man" was found to be true in all the countries represented on the Interallied Scientific Food Commission.

If one now calculates the national food requirement of the United Kingdom for a year, one reaches a total of 41.5 million million calories per annum. Adding to this the ten per cent allowance for waste and loss, the total requirement becomes 45.6 million million calories. Now before this calculation was made the Royal Society had computed the average annual food supply of the United Kingdom during the years 1909-13 as follows:

Home production.....	16.93 million million calories
Imported food.....	<u>30.22</u> million million calories
Total food.....	47.15 million million calories

The "man value" of this is 3,410 calories instead of 3,300 adopted by the Scientific Commission. It appears, therefore, that there is probably very little waste of food in a population like that of England's "tight little island."

It is apparent that, by following this line of analysis, one can estimate the food requirements of each allied country for the year 1918-19 and after this fashion the following figures were reached:

CALORIES IN MILLIONS

	United Kingdom	France	Italy
Total requirement.....	49,600,000	40,916,865	38,000,000
Home production.....	<u>17,200,000</u>	<u>24,519,652</u>	<u>23,000,000</u>
To be imported.....	32,400,000	16,397,213	15,000,000

"But what practical application could be made of this?" the reader will ask. Consider the case of Great Britain, for example. Her population was the equivalent of 35,360,000 "men" and 5,000,000 men in the armed forces. The Food Commission judged 75 grams of fat a desirable quantity for a civilian, while 150 grams were allowed daily for the soldier. To cover this requirement would be needed annually:

$$\begin{aligned}
 \text{For civilians: } 35,360,000 \times 75 \times 365 &= 968,000 \text{ tons fat} \\
 \text{For military: } 5,000,000 \times 150 \times 365 &= \underline{\quad 274,000 \text{ tons fat}} \\
 \text{Total requirement} &= 1,242,000 \text{ tons fat} \\
 \text{Home production} &= \underline{\quad 486,500 \text{ tons}} \\
 \text{Fat to be imported} &= 755,500 \text{ tons}
 \end{aligned}$$

It was further estimated that the reduced quantity of meat taken by the civilian population would amount to 1,200,000 tons per annum and that taken by the army to only a little less. The gross figures were as follows:

Requirement of meat and pork.....	2,102,000 tons
Home production.....	<u>962,000 tons</u>
To be imported.....	1,140,000 tons

The meat products, as planned for importation, contained 334,200 tons of fat which, deducted from the total fat importation program of 755,500 tons, left a remainder

of 421,300 tons which were to be imported in the form of margarine.

Having determined the imports of meat and margarine, the remainder of the calories necessary for the maintenance of the nation could be covered by imports of wheat and sugar, as appears in the following table:

Imports, 1918-19	Metric tons	Calories in millions
Meat.....	1,140,000	3,667,000
Margarine.....	505,000	4,000,000
Sugar.....	1,300,000	5,330,000
Wheat.....	5,330,000 ¹	19,403,000
Total.....	8,275,000	32,400,000

¹ One ton of wheat equals 36.6 bushels and 2200 lbs.

After a similar fashion the resources of France and Italy were analyzed, and their needs provided for. And what good came of it at last? The program laid down became the basis of Mr. Hoover's export program for the year 1918-1919, and the unseemly international wrangling in the meetings of the Meat and Fats Executive became a thing of the past because each nation was adequately and fairly provisioned.

At the opening of the second session of the Interallied Scientific Food Commission, held in Rome in May, 1918, Professor Chittenden, standing in the great room of a mediæval palace which crowns the Capitoline Hill, said that, whereas in biblical times the edict had gone forth from Rome that all the world should be taxed, it was now proclaimed from the same capital city that all the world

should be fed. In the hour of her distress, when her men were dying and suffering, Europe's call to America, " Give us this day our daily bread," was not heard in vain. But the bread has not been paid for, except perhaps in the blood of those dead. America has still generously and graciously to say, " And forgive us our debts as we forgive our debtors."

GRAHAM LUSK

A POSTSCRIPT

I remember my first thrill from a book. It was a passage in one of the reading lessons in the old McGuffey's Fifth Reader — I was a reading marvel and read in this book when I was six. "We must educate; we must educate," ran this passage, "or we perish in our own prosperity. It took Rome three hundred years to die, and our death if we go down will be as much more terrible as our growth has been more wonderful and rapid." I stood barefooted toeing a crack in the floor and felt the orator's thrill as this awful exhortation and prophecy fell from my ineffective vocal organs. It seemed to me that something ought to be done about this thing. I had no idea what Rome was, or how her symptoms developed in that three hundred years of crossing the Stygian ferry, but clearly if education could save us from a worse dissolution, something ought to be done about it. And there I stood, a very ordinary little boy, looking stolid and unimpressed, drawing up and stretching out my toes on the pine floor, and being reproved by the teacher for calling the word "turrible," as fine an example of the need of the country for education as one could have found in that long summer day.

I wonder who wrote that lesson! Clearly it was from some baccalaureate address, and must have been delivered after our country had attained to some greatness, but long before the War between the States. I suspect that it was

from Horace Mann, but there were several men of that period who possessed the vision, the power, and the fervor to have uttered it. It would have astonished him to know—as perhaps he did—of its effect on a queer little boy out in an Iowa schoolhouse on the prairie. It was meant for the ears and the consciences of statesmen. It was Big Stuff. If he could have been given the duty of assigning me something to read, he would probably have selected something within the scope of the juvenile mind. But I doubt if he produced a greater effect on anyone by that speech than on me. I have never seen the piece since. I remember much of it still. I doubt if “The Brown Mouse” would ever have been written, if my mind had not been aroused to the necessity for popular education by those sentences. We never know what print and paper will do. Nor what sort of torch may be lighted, or where, by the flambeau handed down the lines of human succession in the world of thought.

There was abroad then a feeling that education can do anything. We are becoming less confident as to that now. Not that we have ever tried education in the real sense, but we think we have. Three things have yet to be tried by Christendom—Christianity, Democracy and Education. They might all turn out rather well if we should give them a try-out instead of a talk-out. Certainly we shall have failed to put modern civilization on fair trial unless we do try them. We shall fail to discover whether my esteemed friend the baccalaureate orator was right or wrong in his plea that education can save us from

the awful fate he looked back upon and foresaw. I wonder just how much real education can do for this nation?

There is, for instance, the question of the latent capacity for development in the average person. We are periodically assured by specialists that most of our people at the age of thirty have only the mental capacity of ten-year-old children, and are incapable of either becoming anything superior to this, or of transmitting superior qualities to offspring. One might suggest that if this be the case our standards of comparison are too high. Clearly the ten-year-old standard can be no higher than the average standard of the ten-year-old. This would seem to be mathematically indisputable. And then we may well harbor doubts as to the validity of the tests applied.

And the reference to the capacity for leaving good offspring leads us to a vast deal of balderdash which only sounds wise, relating to the betterment of the race, or at least the arrest of the process of degeneration so often pointed out, by eugenic methods. It is balderdash for the most part. If the better individuals in the race are to play a larger part in this process, it involves a competition in prolificacy between them and the ignorant — assuming that the ignorant are unfit to supply the children of the future — and with the degenerate and perverted. In view of the fact that those are usually rated as the better individuals who have most adequately solved the problems of life, this eugenic plan calls upon those who are doing the most intellectual work in the world to take on the additional burden of competing in the production of

offspring with those who do none of it. Aside from the fact that the limitation of human power forbids this as an average result, the difference in the ages at which educated and intellectual as compared with uneducated and subnormal men and women begin the business of becoming the parents of children puts the superior classes at a disadvantage which cannot be remedied. The Chinese boy and girl, for instance, usually have had more children by the time they reach the age when the American boy and girl leave high school, than the American couple ever have. The number of children per family decreases in almost exact ratio to the attainment of the benefits of civilization by the parents. Time and vital power expended in the complex life cannot be at the same time utilized in producing large families of offspring. The principle of the conservation of energy forbids this.

But if we could once draw a correct distinction between those who are normal, and those who are diseased or subnormal, it would in my opinion make very little difference whether the children of the future are brought into the world by educated or uneducated, rich or poor, cultivated or uncultivated parents. So large a part of our personalities are derived from ancestors so remote that we have no record as to their qualities, that family records are of little value. Dr. David Starr Jordan has recently published records showing that such men as Theodore Roosevelt, Benjamin Harrison, George Washington, Abraham Lincoln, Robert E. Lee, and a farmer in Massachusetts are all descended from certain great noblemen and royal personages. This scarcely means that their royal or noble

blood had anything to do with their greatness, so far as they were great. If complete records could be found, it would probably appear that these men were also descended from almost every fertile human strain in the countries from which their families are derived and in existence a thousand years ago. Not only would this be found true of these eminent men, but also of all of us. Our family lines cross and recross as they are traced back. We all are descended, not only from kings and nobles, but from peasants, scullions, outcasts, rich men, poor men, beggar men and thieves. But we take no pains to trace back to the latter. It does not seem to be worth while. Every race is such a plexus of crossing lines of descent, that given absence from moronism, and one family is as likely to produce a superior person as another, if not in this generation, in the next. There is no warrant for believing in the superiority as ancestors of the people we have learned to call great in history. We can tell quite accurately the value of a fowl for either laying or meat uses, or of a beef animal. The carcass tells its story on the butcher's block. The evaluation of a human being is not such a simple matter. It is hard to say which of any person's excellencies are transmissible. And where a person possesses great qualities, it is difficult to say whether they come from natural excellencies, or from fortunate training. Where the qualities are inherited, it is always difficult even to guess from which of its numerous lines of descent it is derived. The fact seems to be that every race possesses a great common fund of virtues, powers, and weaknesses, which must be assumed to belong in the character of every

normal member of it, and that his peculiarities both good and bad are to be attributed to recessive traits accidentally cropping up, to dominances which may be with more or less certainty identified with his known parentage, and to traits developed or distorted by training or the lack of it. The only safe assumption for the race is that all men are equal, and that they are equally capable of receiving benefits from education. Of course they are not equal; but this is a fact that can be told only after the life has been to a greater or lesser extent lived. The only safe assumption is that they are; because while individually they cannot be, in racial strain in the main they are equal.

The exception to this rule lies in the fact that there develops in all societies a class of morons, degenerates, and defectives, who, lacking self-control, give birth to numerous offspring, and in a society like ours, in which all human life is held equally precious, tend progressively to adulterate the racial life-stream with people useless to society, antagonistic to its welfare, and a danger to it. They breed true. They should not be allowed to perpetuate their defective strains. The difficulty of detecting and dealing with them is not great were it not entangled with religious and sentimental elements. But that these people, wholly irreclaimable as they are, and incapable of producing any offspring but their like, must one day constitute a recognized social danger is a thing of which I am convinced. Aside from these really diseased people, the fact must be accepted that our population must be dealt with as consisting of people who must be assumed to have equal capacities for development.

Of course they have not equal capacities for development; but in few cases if any can an inferior or superior endowment be foretold of an unborn or newly-born child. Its racial characteristic alone can be estimated. The fact that for two, three, or even a larger number of generations, its progenitors have exhibited high qualities which, in spite of enormous difficulties, can be definitely attributed to excellencies in personal endowments, means very little in any effort to determine exactly what the bloodstream actually is. And I have assumed the surmounting of obstacles which cannot be overcome except in very few cases. In short, it would be impossible to tell who are the best individuals to select out of any society if we were to begin now a policy of breeding for better people — a national policy of eugenics. We can at most detect only the positively degenerate and defective. This is another fact which warrants the term balderdash when used in describing much of the eugenics propaganda we see.

Still another fact of similar sort would alone forever prevent any great improvement of society by a eugenical system. Any livestock breeder would laugh at the ridiculousness of the question if he were asked if he could improve the breed of any domestic animal in even such a simple matter as the capacity to convert feed-stuffs into good meat, to say nothing of such imponderables as moral and intellectual qualities, except by a rigid control of matings. Under such control none but the best males are permitted to have progeny, and the females also are carefully selected. If we could tell the best male when we saw him in a human society — which we cannot — the

subsequent problems are too revolutionary to be faced even. They involve such a complete abandonment of every moral, sentimental and religious position that the barriers against even an attempt to improve society by eugenics need not be stated. They need only be hinted. We lack the knowledge to begin with; and if we had the knowledge, the use of it would do society a hundred times more harm than it could yield in benefits.

So, after all, we come back to the thought that all we can do is to provide each human plant with soil and air and temperature so that each may be an oak, a corn-plant or a lily as determined by its own inner spirit of growth. We may detect the weeds, and sometimes we may possibly be allowed to pull them out; but even this has its difficulties and perils. Mainly we must adapt our efforts to that wonderful spirit of growth. We must remember that the ignorant clod of an unlettered mountaineer has the same blood as his cousin who has grown proud of his aristocratic strain merely because his ancestors went on through to the Bluegrass soil, instead of tarrying in the hills. The heredity of every person is a mystery; but the conditions under which his best qualities may flower out are somewhat better understood. These favorable conditions are promoted by nothing so easily in the control of society as by education. So I come back to my first text from a book which thrilled me — the text from the baccalaureate sermon in the old Fifth Reader: "We must educate, we must educate, or we perish in our own prosperity. It took Rome three hundred years to die, and our death if we go down will be as much more terrible as our growth has been more wonderful and rapid."

I apprehend that the man who wrote or delivered those burning sentences had in mind as the education which alone would save us from the fate of Rome the thing for the sake of which we have taxed ourselves more willingly than for anything else. Probably he was thinking of something even more inadequate. He doubtless desired a system of schools in which boys, and possibly girls, would be launched into a sea of literature and mathematics, Greek, Latin, French, Italian, the higher mathematics, the things which all through the past had distinguished the educated from the ignorant. This was education, then. To a lamentable extent it is education still. For many years it never occurred to me that it was in any way deficient in the salt which might save us from the putrefaction of Rome. Attic salt was the great preservative.

Finally and slowly the fear began to take possession of my mind that in spite of the fact that the nation seemed to be carrying out with liberality the very program called for in the old oration, we were beginning to show signs of perishing in our own prosperity and were exhibiting symptoms of the old Roman disease. Horatius — he of the bridge — was given of the corn-land which was of common right, as much as two strong oxen could plow from morn till night. We had once had much land which was of common right. I saw it pass from this status to that of private ownership. And then I saw coming upon us the tendency of the people to flock to the cities. When there was no more land which was of common right in the country, the opportunities for the poor man seemed better in the towns. The chances for success seemed better

there than in the country, for the man who had no land. Moreover, when the land was gone which was of common right, that which was of individual possession and individual right grew so valuable that its owners in greater and greater numbers found themselves able to live in the cities, where life was so much "fuller and richer,"—and live on the labor of others. So that the people who remained on the land, in larger and larger proportions of the population, were forced, not only to support themselves, but also to carry on their backs landlords living in cities. I saw grown up before I knew it a land system in which landlords with no traditions of landlord's duty to tenant or land, were rack-renting tenants without knowing it, more cruelly than the absentee landlords ever rack-rented the Irish peasantry. Overurbanization and landlordism! "Great estates," said Pliny, "are what ruined Italy!"

Now what was education doing to keep us from shooting the Roman chute? Seemingly nothing. Why? Well, perhaps there was something the matter with the system of education. Perhaps if the people of the open country were to be given education for rural life, instead of the frustum of a college course, two things might happen: They might see more things of charm and profit in the country; and they might finally know the truth, which might set them free. Anyhow, if education should fail, everything had failed: for this experiment in development by democracy seems the last one to be tried.

So there was nothing left save an examination of this thing which we were trying under the name of education as a means of grace for our declining life, in process of

ruin by latifundia as Rome was ruined. Once fairly examined it was seen as nothing but a sham of an educational system, one which could never have been adopted had any thought been given to Education the Thing, rather than to Education the Word. And even in an era addicted to word-worship, it could never have been adopted had it not been established before modern science had been related to the everyday processes of rural living.

Why, it suddenly became clear, rural life *is* Education. No other life makes imperative the doing of so many things the understanding of which is Education. It is only by obstinately shutting our eyes to the meaning of things that we avoid a liberal education while making a living from the soil. This fact is proven by many, many cases, in which people who have gone through the ordinary sham courses of schools have found themselves unexpectedly gaining true culture through the effort to understand the everyday things, tasks and affairs of rural life. The farm, the garden, the orchard, the poultry-yard, the diseases and pests which infest the plants and animals, the competition of the various forms of life, the problems of the soil, the use of fertilizers, the marketing of products, the local government, the transportation questions, co-operation, governmental relations to agriculture — why, the affairs of every school-neighborhood run out into multitudinous phases of science, art, literature, politics, history, geography, biology, entomology, zoology, ornithology. And in this sort of school these things are not mere branches of study taken up in order that credits may be gained for some promotion to higher schools which the pupils as a

rule will never attend. They are problems which pupils and parents vividly realize are related to the ever-present task of making a living. Such school processes are not preparations for life, they *are* life itself. They run out into the hours spent in the field and in the home, and they lap over into the vacations. They make every act of daily life an excursion into learning, a part of the school curriculum. They are not isolated studies of things selected from life because of their adaptability for use as illustrations of truths encountered in school, as analogous studies must always be in city schools; rather they are revelations of the educational value of almost everything touched by country life. They make of rural living a great book in which everything is registered which the city school can possibly touch, but which in the rural school is shot through with the absorbing interest stimulated by the recognition of the fact that these things must be understood if life is to be successful. And when this is seen, we come to see also that the complete education of a human being cannot be given in the city: that the farm itself is the best educational plant in the world; that, given a few years of public attention to the rural school in recognition of this fact, and people of intelligence will begin to return to the country in order that their children may have better educational advantages than they can possibly have in the city; that by forgetting about preparation for college and university and studying their own problems as school exercises, the rurally-educated youth will become so clearly the superiors of their city cousins in everything which makes for excellence as students, that colleges and universities

will for their own sakes so modify their requirements for admission as to let in these young people with the newer and better preparation, for the further prosecution of their investigations into truth.

And after all, truth is all that matters. After all, the thing which I see in the future is a generation of people accustomed from early childhood to seek truth. When such a generation, trained in its recognition when found, and skilled in finding it, takes charge of the affairs of the world, I am sure that it will see the real enemies of civilization, and will solve the problems called to our attention so long ago in the baccalaureate sermon I have mentioned — “ or we perish in our own prosperity! ”

And that is how “ The Brown Mouse ” came to be written.

HERBERT QUICK

CONSTRUCTIVE ETHICS OF THE NEW ERA; OR THE ROLE OF SCIENCE IN SOCIAL RECONSTRUCTION

IT may be safely asserted that every scientific fact has an ethical value; for everything in science, even to the determination of its concrete facts, lies within the lexism of human behavior. The continuity of influence may be readily traced from such beginnings even to such complex endings as the three great Cardinal Virtues of the New Era. These are Lawfulness, Service and Courage: *Lawfulness* in the sense of a determined purpose of each to conform, and to insist that others shall conform, to the Law that lies deep in the nature of things and that makes for the welfare and happiness of all: *Service* in the sense of helping others to conform to the Law and thus to enjoy its blessings — not words, not mere sentiment, not mere feeling unexpressed and unacted, but service of real helpfulness, given unselfishly, blending benevolence, forgiveness and forgetfulness with tenderness and gentleness and all of Love itself — but without the chill blast of charity; *Courage* in the sense of doing and, if necessary, dying for the Law. These virtues came molten from the furnaces of War to form the stable structure of Peace. And Peace built upon them will most endure, for they are of the Law.

It is important to a fair understanding that the relationship between Lexism and Science on the one hand, and

Religionism and Philosophy on the other, shall be rather more carefully considered. This may well be done by a brief survey of their similarities and their dissimilarities. Thus it may be accepted that, in motive and purpose, all stand alike consecrated to Truth, concrete truth and generalized truth. They alike seek to know truth for Truth's sake. They are alike consciously in the service of humanity.

At this point, however, their dissimilarities begin. Thus Religionism in the Occident is devoted to an understanding of the first cause of things; it is theistic; its fundamental conception is a personal God; it believes in revelation in the sense of a direct communication from God to and through some human agency; it has a system of rewards and punishments in a life after this life; its methods are subjective; it assumes the sufficiency and finality of the scriptures upon which its mission depends; and it claims to teach by authority of divine command. Philosophy, too, deals with first cause. It does this by ultimate abstraction, which may or may not be theistic; its notion of revelation of the life to come and of rewards and punishments varies with the philosophy under consideration; its methods involve a blending of the subjective and the objective tending to supergeneralization and ultimate abstraction.

The ultimate abstractions of Philosophy embrace, *in part*: God, Deity, The Absolute, The Unknown, The Cause, The Creator, The Mystery, Power, The Being, Omnipotence, The Source, Perfect Mind, The Will, Supreme Instance, Omniscience, The Infinite, The Almighty,

The Finite God, The Current, The Summation, Absolute Will, Living All, The Captain, The Altogether; — *strange things*, Horatio!

It stands for its authority upon the intrinsic worth of its content. The individual philosophies generally approach the solution of the great mystery from single angles; or by the attempted application of individual hypotheses to all phenomena, especially the phenomena of human conduct; and, in spite of a general tone of finality, are necessarily fragmentary, out of harmony with the Law, and, consequently, self limiting in both application and duration. Science addresses itself to everything existent; busies itself with relationships and the determinations of cause and effect; its methods involve the perception, accurate determination and logical consideration of facts and their collation, correlation and generalization as expressions of the Law. At this point Science delivers its daily output to the arts and to ethics — and ethics in this sense is Lexism.

It will be seen from this *coup d'œil*, and from what has preceded, that Lexism has nothing to do with either first causes or final effects, with beginnings or endings, or with ultimate abstractions. It is, therefore, neither a religion nor a philosophy. It has no concern with pantheism, polythesim, monotheism, atheism, or any other theism. In the realm of the supernatural it affirms nothing, denies nothing, questions nothing, and is, therefore, not even agnostic. It does not seek to invade the infinite; its field is the finite. It has nothing to do with the *whence*, *why* and *whither*, but everything to do with the *which* and

the *what*, the *here* and *now* of things. In other words Lexism simply busies itself with the affairs of every-day life, with every-day life itself. It is not concerned with the problem of future existence which it leaves entirely in the hands of the religions. It equally avoids such reconcile questions as the reasonableness of reason, the doubtfulness of doubt, the thingness of things, likewise the whichness of the *what*, to say nothing of the *whatness* of the *which*. These are recognized as being among the more profound questions that naturally belong to certain philosophers of the metaphysical type and with whom, it is felt, they may be left with neither regret nor solicitude.

Lexism is complete in the sense that all existence falls within its purview; but it is incomplete in the sense that it embraces only such knowledge as has been reduced to terms of the Law. It, therefore, unlike the religions and the philosophies, does not carry the pretension of finality, but is openly, frankly and of necessity progressive. On evidence it expunges from the record the accepted truth of yesterday as the demonstrated error of to-day, and on evidence adds to the record that which has to-day been proven true. It speaks by authority, the authority of knowledge — Truth — the Law — ascertained by methods of accuracy, confirmed by experience and promulgated by consensus. As the fundamental and determining executive force in human behavior, in life itself, in existence outside of that which we call life, its mandates are imperative and admit neither of appeal nor of stay of execution.

The present status and future mission of Lexism should

be the subject of serious thought. In the first place, then, let it be understood that Lexism is neither a theoretic conception nor an academic proposal; on the contrary, Lexism was, even before the name, and is to-day, a fact — a breathing, pulsating, vibrant, vital fact — an actual functioning force, the most determining force in all human progress. Its subject matter is the dynamics of the universe, the kinematics of life itself. Based upon a continuity of precepts that extends further back in time than any religion or any philosophy now extant, it has grown in volume, force and momentum until to-day, in essence and substance, it is being disseminated through every avenue of contemporaneous education and is irresistibly molding the conduct of the peoples. In the daily press and magazines, in books on education, science and philosophy, in casual conversation, there is constant reference to the "natural law," always more or less vague but always in the sense of inevitability. In schools, colleges, and universities there is actual instruction in the "Natural Law," through whatever department of learning it may be manifested; it is recognized in the pulpits; and even the lawyers have come to recognize that there is a Law back of their law; while on every hand there may be observed a tendency, conscious, subconscious or unconscious, to adjust human conduct to the Natural Law — to the Law! — and this, again, is Lexism. Thus it will be seen that Lexism supplants no religion, no philosophy, but supplements and renders explicit the truth in all religions and all philosophies. It interferes with no man in his search for, and his contemplation of either the sublimest truth or

the most celestial fancy; it even stimulates the most inspiring of imagery; for even the Lexist may stand on the outer margin of the Known, gaze across the realm of the yet Unknown, into the void of the Unknowable, and, with the longings of love, the pigments of fancy, and the alchemy of faith, fashion it with beauty, fill it with light and color, suffuse it with zephyrs, people it with loved ones gone before, and in the midst of all, create in the image of perfection, the beloved Father before whom he bows in adoration! — but this is not Lexism.

A further understanding of the present status of Lexism may be had in reply to the inquiry, who are Lexists? Broadly, all are Lexists who recognize the existence of the natural law — of the Law — and try to conform to its provisions; all who teach the Law, or any part of it, in school, college, or university, in the pulpit, on the platform, through the press, or in the daily walks and talks of life; all religionists who, in addition to their belief in God however conceived, recognize the existence of the Law in nature, however it may have come there, and that its observance is the observance of the will of their God; all philosophers who in addition to their other concepts, whatever they may be, embrace within their systems a recognition of the Law and its relation to phenomena, whether classified as physical, mental, or moral; all scientists who recognize that the chief aim of science is to reveal the Law and reduce it to definite terms, and who recognize in the Law thus revealed not only the chief means to material welfare, but in ethics, the only safe guide to health and happiness, to length and breadth of days.

But if Lexism thus exists in essence, substance and effectiveness, without a name, why bother with the name? The question may be answered by another, or by several: Is not such a potentiality entitled to a name? Will not a name make it less vague, more definite, more recognizable, more voluntarily observable? Will not such definiteness lead to a declared following; a following to organization; to conscious existence; to conscious purpose; to conscious mission? If these questions are to be answered in the affirmative, and they will be thus answered, what is to be recognized as the *raison d'être* as the more immediate and direct objects and purposes of the movement? Briefly they are:

- (1) To promote recognition of the Law in all things,
- (2) To disseminate a knowledge of the terms of the Law as such,
- (3) To teach the relation of the Law to human behavior,
- (4) To encourage observance of the Law,
- (5) To stimulate the further revelation of the Law.
- (6) To perpetuate the names and thus insure the immortality of all who have made revelation of the Law.

These principles and purposes, translated into the concrete of action, imply the study of the Law not only by groups voluntarily organized for the purpose, but more especially by groups now being rapidly evolved in the natural reintegration of society. The Law, interpreted and taught through organized Lexism, would be not an ab-

stract something represented by strings of words and groups of phrases, but something to take home, think about, work with and live not only with but by, in the office, the shop, the factory, in the schoolroom, on the farm, and by the evening fireside. This policy would mean the exposition of The Law, not so much by preaching as by exemplification. A possible Science Director for the community, one properly qualified, properly compensated, and properly sustained in a moral sense, falls within this purview. But such groups would also become tangible and effective agencies for the promotion of the public schools, colleges and universities and their protection against sinister influences. They would, furthermore, be active influences by which the whole teaching profession would be made more attractive, its material rewards enhanced, its personnel consequently improved, its effectiveness increased and its general status, intellectual and social, be made more exalted. The power inherent in such a movement would operate to the higher appreciation and better reward of technical attainment professionally employed in the utilitarian application of the Law. Such organization would afford opportunity to stimulate further Revelation by the canonization of those who have already made revelations of the Law. To illustrate, the lives and achievements of Pythagoras, Plato, Aristotle and Socrates; of Copernicus, da Vinci, Galileo, and Kepler; of Hippocrates, Vesalius, Harvey and Jenner; of Pascal, Newton, Leibnitz, Halley and Franklin; of Lamarck, Darwin, Wallace and Mendel; of Pasteur, Lister and Koch, and of hundreds of others, may well be celebrated on days

set apart on the calendar. In this way those who have best served humanity as Revealers of The Law, and others who may follow them in the cause of Truth, will be assured an actual and tangible Immortality, the immortality of men, by men, among men on earth. Mankind would thus be given more consciously the benefit of their genius as well as the inspiration of their example. And, through the organized influence thus made effective, foundations may be laid and necessary substantial support be given for the promotion of research. Lexism thus made corporate, would naturally become an effective instrumentality for the support of all government in its progressive evolution to the standard of The Law. But above all the object and purpose, the slogan, of organized Lexism must be, — “Carry the Message to the Masses!” The duty is imperative, Man is of to-day. The future is always ahead of him. In the to-day, when creeds have failed, *when* doubt and uncertainty reign, let him turn to kindly Nature, *of which he is a part*, learn her Law, obey her mandates and thus secure for himself the blessings of health, strength, liberty and the joy of existence. The future will take care of itself — and of Man. The Law, the same unchanging Law which has operated through all time, will still continue its all-enfolding embrace and we may depart, as we came, secure in the knowledge that all is well with us as it has been with the countless millions who have gone before, and as it will be for the vast procession of mankind who will follow us.

CHARLES A. L. REED

JUVENAL ON EDUCATION

JUVENAL'S picture of the education of Roman youth is vivid enough to bear out what we learn from Quintilian¹ and others about Roman education from Republican days, and adds enough to let us see the condition of affairs early in the Second Century of the Christian Era, Hadrian's reign.

We know that the child learned Roman probity and manners at home for the first seven years of his life, watched over especially by his mother and his nurse, with his father's eye upon them all; after seven, the boy was his father's constant companion at home and abroad, listening to his conversation with his friends and to his business, except during the time he spent at school, while the girl learned household arts from her mother.

The schools, like all else in Rome, began at daybreak, and the children were conducted thither by an elderly slave who watched their steps and their manners, and carried their books and their lanterns, since it was still dark when they left home.

In the lowest school, the *litterator* taught the rudiments, a little later the *grammaticus* taught the elements of literature and composition, and later still the *rhetor* practised his pupils in the art of advanced composition and declamation.

¹ Marcus Fabius Quintilianus, *De Institutione Oratoria*.

Girls might go to school as well as boys, and some fathers employed private teachers instead of sending the children to school.

In the elementary schools the children learned the three R's; there was very little in the way of arithmetic, and their reading and writing were first simply the forming of letters, and then learning to write from dictation such things as the proverbs and gnomic wisdom of the reading lesson provided, in addition to the laws of the Twelve Tables.

The *suasoriae* were the chief exercises in the grammar schools. They were what we should call compositions based on passages in the children's reading of Vergil or Horace or Cato or some other Roman writer, or perhaps on incidents in history, in which the youthful authors represented a character as defending his action or as explaining it. Hannibal, for instance, was a favorite, and he was made to explain what causes actuated him in his campaign against the Romans.

In the school of rhetoric the study of literature was extended to include Greek authors and the compositions were, besides advanced *suasoriae*, a new kind, called *controversiae*. This was in the nature of a criticism of an action, such as, for instance, pointing out to Caesar that his crossing of the Rubicon was not the best thing to do under the circumstances, and suggesting a better plan. Both of these exercises remind us of the subjects so popular in modern times in debating societies, where knowledge after the fact changes the point of view and the time

that has elapsed since the subject was first discussed makes it perfectly safe to disagree or to find fault.

Decius Junius Juvenalis devotes one third of one Satire and one half of another to criticizing the conditions of his day in regard to education, and in sternly rebuking fathers for setting bad examples to their children. In addition there are many passages scattered through the sixteen Satires which throw light on the customs of the times. Most of these speak for themselves.

The theme of Satire XIV is the force of example and hence the importance of fathers setting good examples for the children to follow. "There are many things," he says, "deserving of condemnation which parents themselves teach to their children."² If the father gambles, the youth will do likewise, even while still a child. If the father is a glutton, the child will copy him, and though you put a thousand bearded schoolmasters on either side of the boy at seven (and after) to teach him to be abstemious, the youth who has constantly before him the bad example of an extravagant father will still prefer extravagance.

Or, if a father is cruel to slaves³ in the presence of his children, can he expect the children to learn to be kind and gentle? Juvenal asks.

The poet goes on to say that the children should be allowed to see nothing from which they might learn anything harmful, and it is here that we find the famous line

² XIV, 1-14: *Plurima sunt . . . quae monstrant ipsi pueris traduntque parentes, etc.*

³ XIV, 15-24.

(XIV. 47) "Maxima debetur puero reverentia"—
"the greatest reverence is due to youth."

Juvenal takes up, one after another, all the great vices of his times and treats them with scorn. It is a law of nature, he says, that the young should take after their elders, and learn what is good or bad from them. In former times fathers taught their sons to care for probity, but now they only teach them how to get rich, since no one asks whence your wealth comes if only you have it. This lesson, Juvenal says, little boys learn from their nurses and little girls know before they learn their letters: (XIV. 209) "Hoc discunt omnes ante Alpha et Beta puellae." Indeed, they are so good at learning these early lessons that the pupil (*discipulus*) will outstrip the master (*magister*), and when your son is grown he will cheat you also, the father is admonished.

The "Alpha et Beta" refers to the activities of the *ludus* or elementary school, while the "bearded schoolmasters" inculcating moral lessons (XIV. 12) were the teachers in the grammar school. It was here that the rudiments of grammar were taught (VI. 452, and VII. 215), the rules of which were learned by heart, and the children wrote and declaimed *suasoriae*.⁴ Corporal punishment was not unknown, and we find mention of the rod, though Juvenal does not tell⁵ us what misdeeds caused hands to be held out for the application of it. The teacher sat in a high chair⁶ (*cathedra*) while the children stood before him and

⁴ Juvenal I. 16; cf. also Quintilian, *Inst.* III. 8.

⁵ I. 15: et nos ergo manum ferulae subduximus.

⁶ VII. 203.

read aloud from Horace and Vergil⁷ all blackened from the smoke of their lanterns, the smell from which Juvenal considers not the least of the teacher's troubles. And since each boy had a lamp it may not be only the poet's exaggeration when he says that nothing would induce him to spend his nights and early mornings in an atmosphere no blacksmith or weaver could stand.⁸

Another difficulty for the teachers was the fact that the parents expected them to be very well prepared, and learned in the smallest details of grammar,⁹ history, and mythology, and to watch over the children's behavior with the greatest attention, only to pay them at the end of the year¹⁰ no more than public acclaim gave to a victor in the circus or the ampitheatre.

The schools for rhetoric, which were the most advanced, the pupils attended usually from their twelfth to about their sixteenth or seventeenth year. *Controversiae* or arguments based on something in their reading of literature or history was the chief kind of composition practiced, and Juvenal pities the poor teacher who has to listen to his classes slaying dread tyrants¹¹ or advising Sulla to save himself from an early death by retiring from political activity.¹² There was not much variety in the choice of subjects.

Declamation was the other important subject of study

⁷ VII. 227.

⁸ VII. 223.

⁹ VII. 230 ff.

¹⁰ VII. 243.

¹¹ VII. 150 ff: Declamare doces: o ferrea pectora Vetti, cum perimit saevas classis numerosa tyrannos.

¹² I. 16: et nos consilium dedimus Sullae, privatus ut altum dormiret.

in the schools of rhetoric. The students recited speeches which had been written for the purpose or else selections from great authors. These pieces were practiced with the intention of reciting them on public exhibition days (cf. Persius, *Satires*, III. 47) and necessitated frequent repetition with appropriate gestures. The class stood while practicing their speeches, and instead of pitying the teacher for having to take such pains with stupid boys that one would think, as Juvenal does, that he would die of weariness, we might pity the boys whose ambition led them to try again and again in the hope of mastering the art of the orator and all his tricks. Except of course that if a boy learned to be an orator he would then plead real cases and become a lawyer, a profession that paid far better than the teacher's, and carried with it the prospect of political advancement.

There was no reason why girls should not attend these schools as well as boys, though it seems more probable that they had private teachers after the grammar schools especially when we remember that the age for marriage for a girl was from twelve to sixteen. But there is no doubt that women were educated, and Juvenal's contribution to this point is his diatribe against bluestockings.¹³ Whether he really hated learning in women or only objected to one who monopolized the conversation to show off her knowledge of grammar and her skill in discussing literary questions, it is hard to decide. He certainly thinks that a husband ought to be allowed to make a mistake in grammar! "Soloecismum liceat fecisse marito."

¹³ VI. 434-456.

And many people even to-day will echo Juvenal's regret at the lack of respect shown to teachers in his own day (and later), and sigh for the good old days when the teacher was regarded as being " *in loco parentis.*"¹⁴

HELEN H. TANZER

¹⁴ VII. 209.

THE ROMAN STONE

(RED PORPHYRY)

EVERYONE — at least, every tourist in Rome — has read the boast of Augustus, now hackneyed by much quotation, that he had found Rome built of brick, and had left it built of marble.¹ But, as Arthur Hugh Clough, the poet, implies, something here needs further explanation:

“Brick-work I found thee and marble I left thee,”
boasteth Augustus.

“Marble I thought thee and brick-work I find thee,”
exclaimeth the tourist.

Certainly a large part of the visible ruins in Rome seem made of brick, and not of marble. But when the tourist is told that the brick-work before Augustus' day was mostly sun-dried brick of which no trace now remains, and, further, that the bricks which he sees on all sides have no organic connection, for the most part, with the building in which they are used,² the mystery only deepens as far as bricks are concerned. Nor is the case clearer as to marbles. He will be told on the one hand that Rome is richer in this material than any other city not built in the

¹ Suetonius, *Vita Aug.* XXVIII. 3, Marmoream se relinquere quam latericiam accepisset.

² Middleton, *Remains of Ancient Rome*, I, p. 11, “The existing examples of brick in Rome are used merely as facing to concrete walls; no wall is ever of solid brick.”

immediate vicinity of quarries⁸; on the other hand, that with a few exceptions no Roman building was constructed of solid marble. The tourist will probably conclude that the art of building in Rome was a series of puzzles.

The explanation of the last statement is, of course, very simple. Marble and similar materials were, speaking broadly, simply ornamental. The arch, the vault, the dome,—in other words, the most characteristic developments of Roman architecture,—in constructive principle and practical application owed nothing to any quality of marble. It was the very homely and generally unnoticed concrete that enabled the engineer to pile arch on arch, to superimpose order on order, for the erection of a Coliseum, or to throw his dome recklessly across the air from wall to wall of a Pantheon. To all this the marble was simply a glorified surface covering,—the trimmings on the dress, whose fit and durability were due to quite other fabrics.

But what magnificent trimmings! What other material could more impressively, more fittingly, have symbolized the enormous wealth, the insatiable love of splendor and display, the pride, the power, the luxury of imperial Rome, than the rare and lovely stones with which she incrusted and adorned her buildings. The story of Roman infatuation for such material is an amazing tale. For five centuries the known world was ransacked for stones. Basalts, and granites, and alabasters from Egypt; granite from Elba and Sardinia; purple marble from Asia, reds and blacks from Sparta, yellow from Africa, white from Paros

⁸ H. W. Pullen, *Handbook of Ancient Roman Marbles*, p. 5.

and the other Ægean isles; verde antico from Thessaly; breccias from Spain, from Epirus — not to speak of the masses brought from Luna near at hand. All these and many others were quarried, sawed, carved, and brought to Rome in incredible quantities, cluttering her wharves and blocking her streets, all to adorn the surface of her houses and minister to her frantic love of display.⁴

Horace, who saw the beginnings of this passion, speaks, as his readers will remember, with deprecation of the *Phrygian stone*, *Hymettian marble*, and *columns hewn in far-off Africa*. Later moralists often mention it as one of the most characteristic displays of ostentatious wealth. The elder Pliny stigmatizes it as a vice, and rebukes it in his most rhetorical style:

"It now remains for us to speak of stones," he writes at the opening of his thirty-sixth book, "*the leading folly of the day.* . . . As to the mountains, Nature has made these for herself as a kind of bulwark for keeping together the framework of the earth. . . . And yet we, forsooth, must hew down these mountains and carry them off for no other reason than to gratify our luxurious inclinations. Promontories are thrown open to the sea and the face of Nature is being everywhere reduced to a level. We carry away the barriers that were destined for the separation of one nation from another; we construct ships for the transport of our marbles, and amid the very waves we convey the summits of the mountains to and fro. . . . For what utility or for what so-called pleasure do mortals make themselves the agents, or more truly speaking, the victims of such undertakings, except in order that others may take their repose in the midst of variegated stones."

Among all these materials sought for with such eagerness there is one which may be regarded as a good type.

⁴ Lanciani, *Destruction of Ancient Rome*, *passim*.

It came from a great distance from Rome; it was quarried and transported with the utmost difficulty; it was extraordinarily hard to work; and by a strange freak of fortune its very color associated it with those ancient traditions of kingly and tyrannical power which were revived and realized by the Empire. It is no cause for surprise then that the purple porphyry of Egypt, the *porfido rosso* of the Roman scalpellini, came at last to be known as the *Lapis Romanus*, the Roman stone in the most characteristic sense.

This name was not, indeed, applied to it at first. It is distinctly post-classical. Pliny in his chapter on stones speaks of it as *porphyrites*, and other classical writers generally use some epithet referring to its color.⁵ While its hue varies somewhat — there are darker and lighter species — its characteristic color is a deep purplish red, the surface when polished being irregularly spotted with pinkish-white crystals, more or less rectangular in shape. No one ever has much trouble in identifying it after once seeing it, and so widely does it occur and so intimately is it associated with the "Grandeur that was Rome," that no visitor to the Eternal City, no matter how unarchaeological he may be, should fail to make its acquaintance and know some of the very interesting facts of its amazing history.

The name *Lapis Romanus* (Roman Stone) occurs only very late. Faustino Corsi, whose book on marbles and other building stones, written one hundred years ago, still serves as the point of departure for most essays on these

⁵ E. g. Lucan, *Pharsalia*, X, 116. *purpureus lapis*.

subjects, quotes from Codinus,⁶ a writer of late Byzantine times, the letter of a Roman lady named Marcia, in which she informs the Emperor Justinian that she has sent him eight "*Roman columns*" to adorn the church of St. Sophia at Constantinople. Corsi quotes also a second writer, Cedrenus,⁷ who says that Constantine was buried in a coffin of "porphyry or Roman stone."

And Constantine Porphyrogenitus,⁸ speaking of a vase, says that it was formed of "Egyptian stone, which now we call Roman." Well does it deserve the name! Every fact about it — its source, its transport, its working, its use — exhibits in the most vivid form the love — the *mania*, one may justly call it — of the Romans for costly materials. To begin with, the quarries which supplied it were in the region east of the Nile, a site about as far off from Rome as the then known world could present, and rendered still more nearly inaccessible by the desert which surrounded it, the scarcity of water, and the fierce heat of its climate. Just where the Gulf of Suez joins the Red Sea there lies on the African Coast a small harbor, which in the days of Strabo the geographer was one of the most important ports for trade with the far East. It was said to have been founded by Ptolemy Philadelphus, who reigned in Egypt in the third century B.C. The Greek name of the port was Myos Hormos — "Mussel Harbor." From this point a caravan route strikes southwestward

⁶ Codinus, *De Origine Constantinop.*, p. 65. He wrote toward the end of the Byzantine empire.

⁷ In his *Compendium of History*, written at the end of the eleventh or the beginning of the twelfth century.

⁸ Emperor at Constantinople, 917-959 A.D.

and, after some hundred miles of desert waste, reaches the Nile near Coptos, not far from the site of ancient Thebes. Along this route, difficult and dangerous, and inconvenient as it must have been, trade with the Orient was carried on, in preference to seeking an outlet through the Gulf of Suez and across the sandy isthmus.

About twenty-five miles inland from Myos Hormos a range of mountains in places about 4000 feet high runs north and south, and here, in the form of a huge horse-shoe-shaped dyke of extended rock, lies a ridge that is practically a mass of red porphyry. It was from this desolate corner of a torrid desert that the Romans obtained it, and, as far as we know, from no other spot.

It is commonly said that the early Egyptians did not know of these quarries. Certainly, for some reason that is not apparent, they made very little use of this material. Yet even in Pre-dynastic times the artisans of Egypt, like primitive man in many parts of the world, were able to work with amazing skill the most stubborn material, and they could hardly have been deterred from using porphyry by its hardness alone. Yet scholars in the Egyptian Department of the Metropolitan Museum in New York could produce only the scantiest references to the material in the literature of Egyptology. Some amulets from the Pre-dynastic period, and a fluted bowl or two from the Old Kingdom, are the only objects of which they can find certain mention.

Weigall in his *Travels in the Upper Egyptian Desert*, (ch. IV, p. 109) states: "This purple porphyry was not known to the ancient Egyptians; a Roman prospector

must have searched the desert to find it." But that matter probably will bear further investigation. One suggestion on this subject I quote for its interest, without endorsing it: Schneider,⁹ whose monograph on Porphyry is by all odds the most extensive treatment on the subject, suggests that the purple stone was thought to bear too close a resemblance to the clotted blood of the typhon Set, the slayer of Osiris, the subject of a story in Egyptian mythology. And he thinks, therefore, that superstitious scruples led the early Egyptians to refrain from using the stone except in a few instances.

Whether it was really reserved for a Roman prospector to discover the porphyry quarries, or whether they were opened and used in the Hellenized Egypt of the Ptolemies, are other questions that still await an answer. More probably the latter statement is correct. The few objects mentioned above show that the material was known in early Egypt. The quarries, situated on a prominent trade route, could hardly elude observation. With the growth of luxury in Alexandria and the increased desire for costly and beautiful building materials, these quarries were probably put into requisition.

One conspicuous use of red porphyry has been, and for that matter, still is, its employment with white marble and other materials in small pieces, for the pavements of temples and churches,—the so-called *Opus Alexandrinum*. The name has been thought to be derived from the Emperor Alexander Severus, but a much more likely

⁹ Oskar Schneider, *Naturwissenschaftliche Beiträge Zur Geographie und Kulturgeschichte*. Dresden: Bleyl und Kaemmer, 1883.

source is the name of the Egyptian capital itself. One may hazard the conjecture that it was from the gay and luxury-loving Alexandrians that Rome imbibed some of her passion for expensive building materials. And she probably found there works of art and architectural ornaments made of red porphyry.

The material was always relatively expensive at Rome, and it seems from the first to have been an imperial monopoly. As was the case with several of the marbles, the porphyry trade was organized and placed in charge of a governmental office. There were superintendents and agents and their subordinates, with their appropriate titles, some of which are preserved to us in inscriptions. There were guards of soldiers, and gangs of slaves; roads were built across the desert and ships provided to transport the produce of the quarries to Rome. Just when the Romans first had their attention directed to it has been a matter of debate. Pliny (XXXV, 11) remarks:

Vitrasius Pollio, who was procurator of Egypt for the Emperor Claudius, brought to Rome some statues made of this stone; a novelty which was not very highly approved of, as no one has since followed his example.

This is the earliest reference we have to porphyry. On the face of it the reference is to statues only, and many of us would echo the censure of the critics in Rome. It is not a pleasing material for statuary. The later Romans, with more degenerate taste, used it for statues not infrequently, and their example was followed in Renaissance times.

But does this statement of Pliny mean that the Romans before his day had made no use of porphyry at all? There

is the point of debate. It seems to me that they almost certainly did know of its use in other ways, and I think that there is evidence in Rome to prove it. But that is another story.

In another fifty years from Pliny's day we have proof that it was used in architecture, though evidently an unusual luxury. An interesting story is told by the biographer of Antoninus Pius to illustrate that emperor's mildness of disposition:

When he was visiting the house of Omulus, he noticed with surprise some porphyry columns, and asked whence they had been obtained. Omulus replied: "When you come into another man's house, you ought to be deaf and dumb." And the Emperor received this reply without resentment.¹⁰

The point of the Emperor's question was the fact that the quarries were imperial property, and Omulus had obtained the columns without proper authorization. The anecdote shows, moreover, that the material was still regarded as a costly rarity,—too much so for the house of a private citizen.

For three or four centuries at least this organization kept up a steady supply of this much-admired stone from the distant corner of the Egyptian desert to the all-exacting Mistress of the World on the banks of the Tiber. Emperors vied with their predecessors, and each strove to make a more extravagant use of this rare and costly stuff. Statues, on an ever-increasing scale of size,—and, to

¹⁰ Julius Capitolinus: *Vita Anton. Pii*—Quum domum Omuli visens miransque columnas porphyreticas requisisset unde eas haberet, atque Omulus ei dixisset quum in domum alienam veneris, et mutus et surdus esto,—patienter tulit.

many tastes, of increasing ugliness; — sarcophagi; vases, and basins; gigantic bath-tubs and fountains; rosettes and plaques and mouldings for architectural ornaments; and then columns, monolithic or made of huge drums. Nothing was too grandiose for these masters of the world, who used the stone regardless of the expenditure of treasure and the cost in toil and tears and blood of their subjects.

When the seat of empire was transferred to Constantinople, Rome was plundered of her art treasures to adorn the new capital, and among the most desired objects were those made of porphyry. Reference has already been made to the columns sent by the Lady Marcia; they were said to have been taken from the temple of the Sun erected by the Emperor Valerian. And this is only one example out of a thousand acts of pillage.

In the succeeding centuries this example of plunder was followed for the benefit of other cities. Columns and other objects of porphyry were carried to Ravenna, Palermo, Venice, Naples, and the smaller towns of Italy. Few cities of the Mediterranean lands did not secure some specimens; some of which have an interesting history of wandering. Objects made of this material have been found in Roman ruins in Africa, Spain and Gaul.¹¹ In modern times it has been carried still more widely afield. A notable collection of porphyry statues, vases, busts, pillars and other objects is described by Schneider as having been made at Potsdam by a Prussian Prince. Nearly every capital in Europe has some pieces of the material, in

¹¹ But not, it is said, in Britain.

church or palace or museum. Even America has specimens. I have a note of some busts in the Boston Museum and the Metropolitan; two large slabs and two slender columns in the library of Mr. J. P. Morgan in New York City; and a large sarcophagus (originally, no doubt, a bath-tub in a Roman bath!) which is said to be in the Morgan Memorial Museum at Hartford, Connecticut. And all this material, so far as known, was brought out from Egypt under Roman supervision in Roman times.

After the downfall of the Western Empire and the conquest of Egypt by the Arabs the quarries ceased to be worked. Their very location was forgotten for centuries, though the tradition of an Egyptian origin seems never to have been lost. All through the Middle Ages and the Renaissance and even in modern times the demand for porphyry has been met by plundering the ruins of Rome. Her palaces and temples and porticoes have furnished the supply visible to every observant eye in Rome. Columns, like the gigantic pair that hold up the triumphal arch in S. Chrysogono, or the beautifully polished pillars of the baldacchino in S. Pancrazio, or the two that so exquisitely frame the bronze doors, with their lovely patination, of SS. Cosma and Damiano, looking out upon the Forum. Again, we find it in the shape of circular slabs, one of the elements in the gorgeous patterns of old pavements, such as delight the beholder in Santa Maria in Trastevere and many another venerable basilica.

Yet after all these centuries of cutting and sawing and breaking and filing and fitting, Corsi, one hundred years ago, could count in Rome 156 columns of this material still intact!

But let us turn our attention again to the quarries. The first mention of them occurs in Pliny. A century later the geographer Ptolemy (IV. 5) gives the situation of *Mons Porphyrites* or *Mons Claudianus* as in $26^{\circ} 40'$, northeast of the Nile.

In the time of Antoninus Pius, Aristides states that the quarries were in Arabia, i.e., east of the Nile, and in a region so destitute of water that the condemned criminals working them did not need to be watched. Life there was an ever enduring process of being burned!

Gradually the knowledge of the place was completely lost. Rozier (*Description de l'Egypte*), one of the savants who accompanied Napoleon's expedition to Egypt, states that the position of the porphyry quarries was still unknown. One of his own guesses, however, came near the truth.

They were finally discovered by the English travelers, Burton and Wilkinson, in 1822. The best report of the discovery is given in the *Journal of the Royal Geographical Society of London* in the volume for 1832. The site was visited a short time afterwards by the German Schweinfurth, who made a careful survey of it, of which Schneider gives a full *résumé*. Of later visitors I can find no record until, about forty years ago, a Mr. Brindley of London, an architect, conceived the idea of re-opening the quarries and made a visit of inspection. His report was given November 20, 1887, before the British Institute of Architecture. Wilkinson records that on May 6, 1823, they had the satisfaction of coming upon ruins of some extent and realized that they were viewing the vast quarries

from which the Romans took so many superb pieces of porphyry. It had evidently been a military station; there were ruins of barracks for soldiers and houses for the officers; scattered houses, perhaps for workmen. Workshops, storehouses, one or two temples; two wells, one of fifteen feet in diameter, sunk in the solid porphyry rock, thirty-eight feet of depth being still visible. Inscriptions were found, in Greek, but of Roman subject matter; those quoted were of the time of Hadrian. Nothing was found to indicate that the quarries had been worked before the Romans took them in hand. Abundant traces of their work were scattered around. One unfinished column was found, more than 20 feet long and $3\frac{1}{2}$ feet in diameter. Quantities of chips indicated that large blocks were roughly dressed into shape at the quarries, precisely as is done now, and for the same object of facilitating transport. The blocks were evidently quarried high on the slopes and lowered on sledges over paths prepared for the purpose, a process which in the marble quarries of Carrara is to-day called *lizzatura*.

"Some marks on the blocks," writes Wilkinson, "seem to indicate the number of stones cut by each workman; and that the men who worked here were condemned to complete a certain quantity of work, according to the offense for which they were sentenced; for nothing can induce me to think that any men but those who were condemned to do this labor would ever endure the heat."¹²

It is amusing to note that Brindley, who was interested in re-opening the quarries, states that the stone might be

¹² In the above account, and elsewhere, I have used material given in the convenient hand-book by Miss Mary W. Porter: *What Rome Was Built With*.

quarried with comparative ease, and expresses the opinion that the heat is not so unbearable after all.

To be condemned to the quarries, *ad metalla*, in Roman times was regarded as almost equivalent to a sentence of death. The worst of slaves and desperate criminals were sent to this hopeless end, and it is commonly believed that in the days of persecutions many Christians were condemned to the same fate.¹⁸ The interesting old church of the Santi Quattro Coronati still preserves the memory of the workers in stone, who according to the narrative of their *Passio* were condemned for their faith in Christ to the porphyry quarries of *Pannonia!* Probably a mistake for Africa. By divine power they were enabled to excel in carving the difficult material into the various shapes demanded,—vases, bowls, and architectural ornaments,—so much so that they were set to work at the harder task of carving statues of the gods. But this they refused to do and paid for their firmness with their death. The little Capella di San Silvestro in the church is most appropriately, therefore, in the possession of the scalpellini or stone workers of Rome, one of the oldest guilds in the city. Except for the miraculous skill spoken of in the legend, the least credulous can hardly find reason for doubting the probability of the story, and it certainly adds to our interest in this wonderful stone to associate it with the “blood of the martyrs which was the seed of the church.”

Undoubtedly, as this narrative implies, the working of

¹⁸ Eusebius (*De Mart. Palaest. viii. I.*) is quoted by Blümner as authority for the statement that countless Christians were busy in the porphyry quarries of the Thebais. This was, as stated above, the point on the Nile to which the stone was transported from the quarries.

this stone is a matter of great toil. Like all minerals made up largely of silicon it is extremely hard. My geological colleague after testing it reported it nearly as hard as glass, and the best of tools are quickly blunted on its surface. We are told that the huge sarcophagus now standing in the Sala a Croce Greca of the Vatican Museum (a block 13 feet high by 8 feet long) was originally the coffin of the Empress Helena and was found in her tomb at the Torre Pignattara on the ancient Via Labicana. Anastasius IV in 1154 moved it to the Lateran to serve as his own sarcophagus, and it was placed near the Porta Santa. In 1600 when the Basilica was undergoing repairs the sarcophagus was broken, and Pius VII in the early nineteenth century had it moved to the Vatican and repaired. The story now told is that it required twenty-five skilled workmen for twenty-five years to restore it, and that the cost of the work was over \$90,000.

One need not take these figures too seriously; but there is no doubt that the material is hard to work. As usual, it has been imagined that the ancients had some secret art by which they accomplished the work more easily than it can now be done. Vasari in the Introduction to his *Lives* gives an interesting account of experiments carried on in his day, when (so he states) the artists, even the great Michaelangelo, were quite unable to make statues of porphyry and only with great difficulty did anything with it. Before that time, he remarks, a certain Leon Battista Alberti had done wonders by tempering his tools in a bath of goat's blood, and some workers employed this recipe in Vasari's day! But Duke Cosimo

de Medici had made a profound study of the matter. By preparing a bath from the extracts of certain secret herbs he could so temper tools that one Francesco del Tadda, a carver of Fiesole, had succeeded in executing important works in this stubborn material.

Winckelmann in the eighteenth century makes practically the same statement, namely, that the art of working porphyry had been lost. He even thought that the famous sarcophagi of the Norman kings of Sicily, now in the Cathedral of Palermo, were of ancient Roman work, and he could not believe, what is now the common opinion, that they were made in the Middle Ages.

It is apparent to anyone who examines the extant monuments that it is a mistake to believe that the art of working porphyry has ever been totally lost. In most generations some one has been found ambitious enough to undertake the task of working it, and patient enough to accomplish it. From Winckelmann's own age there is at least one monument, easily visited, which disproves his theory. A wall tomb in the north aisle of Santa Maria del Popolo, dated 1751, has a noteworthy piece of carved porphyry. There the sculptor has shown his skill — or his scalpel-lino's — by treating the stone as a plastic material, and has flung against the wall a curtain of many folds cut from this stubborn stone.

It would be too long a tale to attempt even to name the many famous monuments made of porphyry, or even to mention the most interesting pieces that remain, some of which have had a long and varied history. Yet it is worth while to call attention to one of its unique uses.

Schneider states that the circular slabs of porphyry still seen in so many of the beautiful old pavements of churches in Rome, are representatives of an old custom of placing such slabs at points which would be occupied by dignitaries at significant moments in the ritual. Doubtless most of those now visible were located for purely decorative reasons, but there are some facts and traditions which seem to hint at the reality of such a theory. From such a porphyry disk in the chamber of a well-known ecclesiastical court it derived its name of *Rota*. Even the guide books call attention to the slab within the entrance of St. Peter's, and repeat the statement that Charlemagne and later emperors knelt on it when being crowned by the Pope. Tradition not infrequently connects a piece of the stone with famous events, as, for instance, the rectangular slab still preserved in the wall of the cloisters at St. John Lateran with the inscription stating that on it the soldiers had cast lots for the garments of Christ.

At Constantinople, we are told, the stone was intimately associated with imperial power and dignity. The very highest officials sat on thrones carved from it or stood on ceremonial occasions on slabs sawed from blocks or columns of porphyry. It is even written that when the Byzantine empress was about to become a mother, she repaired to a special room adorned with slabs of it, and only those members of the imperial family — so the tale runs — were accounted of full rank who were thus "born in the purple," the porphyrogenetti, so called from this stone and not, as often assumed, from the purple dye of robes.

One need not accept these stories at their face value. They are repeated here only to remind us how unique a place the stone occupied in the thoughts and imaginations of men; in that regard it makes little difference whether the traditions had realities behind them or not. So, too, the human interest makes it worth while to repeat the following anecdote without inquiring what degree of authenticity it possesses:

There is a large slab of porphyry at the entrance to St. Mark's Cathedral at Venice on which, so the tale runs, the German Emperor of the Holy Roman Empire, Frederick Barbarossa, knelt when making his humiliating act of submission to Pope Alexander, in 1177, whose feet he kissed as they rested on the purple stone. In November, 1866, King Victor Emanuel visited Venice for the first time, and his attention was called to this slab by Cardinal Trevisanto, who for obvious reasons related the triumph of ecclesiastical over civil power. The King appreciated the situation but contented himself with turning to the minister in attendance and remarking: "*Tempi passati, nicht wahr, lieber Baron?*"

One can find chips of porphyry in countless places in and near Rome; — at Hadrian's labyrinthian Villa, or in the rubbish-heaps of dusty little piazzas near forgotten churches on the Aventine; on the sites of villas or tombs in the wide Campagna where the plough has turned them up to be washed by the winter rains, or on the Quirinal Hill where an electric conduit is being laid; in the soil of cloistered gardens and in the flower-plot near the Pyramid of Cestius where one goes to visit the grave of Keats.

And it is always of *tempi passati* that the stone speaks,—the Past with its triumphs and its agonies, its tyrannies and its martyrdoms, its frantic passions and its long decay. It is indeed the Stone of Rome.

G. M. WHICHER

GREEK AND TEACHING

WHEN as an officer of Phi Beta Kappa, I came to examine the condition, requirements, standards and standing of Hunter College, to act on a petition for a chapter of this fraternity of higher learning, two facts were, I found, conspicuous, the number of its graduates who took up the beneficent and beneficial task of teaching, and the proportion of its undergraduates who took Greek. These twain do not always go together. There are those who teach teachers who take no thought of Greek and their daily tongue doth bewray them. Diction and scription together betray that they have never learned "what drink the vines of Greece produce." When such come to lay out the work of a new school they look on the classics as "a Greek invocation to call fools into a circle" and exclude them altogether.

But not in Hunter. It is not necessary there, as in too many colleges and schools for women, to repeat Shelley's question, "Are there no Grecian virgins?" There are instead Grecians a-plenty, as is true of our great State Universities of the West. Once, in the presence of the president of one of these institutions, I proposed that Phi Beta Kappa should as in its earlier days require the classics for membership. "If we did that," said he, with prescient indignation, "we could not elect anybody but women to Phi Beta Kappa in _____ University."

There too, as I knew, most of the women looked forward to teaching and backward to Greek, well-learned, when they left the institution.

Nothing is an accident. In learning the path closed is sought by the newcomer. Our recent immigration from Russia, where the path of higher learning was closed to the Jew, turned to college and university on arriving here and swarmed to callings long denied. So did the Irish eighty years ago when they came here from an island where college studies and universities were barred in a bigoted past by English laws. The same objection was made between 1840 and 1860 that the Irish were overcrowding our institutions of learning, a complaint as fallacious then as now and as certain then to disappear as now. No haunt of high study can ever be overcrowded by willing learners unless the ghosts of dead and disgraceful prejudice haunt them. For the student there is always room.

Greek and Latin have always been pursued, but not always overtaken by women, from the earliest days of the renaissance, but as these tongues ceased to be a lofty enthusiasm and became profitable for the life that now is and became open doors to various callings, they were eliminated from the teaching of women because idleness and feminine refinement were associated together and their minds were held to be unfitted for the tongues of the past and the tongues of the present were substituted. This exclusion was part of the servitude of women, and as we all know with feminine emancipation women turned first to joys denied, as has been the habit of human nature from the beginning of time. How perilous then are those who

multiply commandments and treat ethics as a doctrine of exclusions and think morals and morality can be increased by searching out forbiddals. On such lies heavy the ban and the curse of Freedom and of Righteousness.

Women have thereof added much and many to the zeal and the number of those who seek first the kingdom of the ancient learning. Through them, to quote again the great Prophet and Advocate of Hellas, Shelley, "The Greeks expect a savior from the West." I know no one of the newly elected college presidents of the recent years who has presented so sound a work in the classic field as the freshly chosen head of Bryn Mawr College,—happy home of learning alike vigorous and liberal,—Miss Marion Edwards Park, to whom I rejoice to pay homage by the name and superscription under which I have had the honor of knowing her for over a score of years. This fortunate increase of the students of Greek and Latin is not, I regret to say, universal. It is less frequent from the "social life" type of women's colleges whither go those who seek "country club" ideals in their collegiate ambitions.

In co-educational colleges, this new group who follow in the steps of Erasmus "the first Greek to touch the 'English' strand" has had two misfortunate fruits. Men leave the studies women take. This strictly anthropological tendency, sign and mark also of our young barbarians at play, arises from another cause easily understood. Greek and Latin and "outside" activities do ill agree. Often they exist together, but the inevitable tendency is the other way. It is easier to follow the example of Greece in

the Palaestrum than in the Academy, and the fields of Elis are more tempting than the grove of Plato. There are certain fundamental toils inseparable from a translation both happy, accurate and novel from Greek or Latin which do not attend glibly echoed opinions on English literature whose race can be run without a horse and its honors won without the toils of a lexicon and the measured weighing of words, aptly chosen. These various conditions and obstacles have their inevitable effect on young men who value their college letter above the best of all training for letters, and yearn for the thunder of the bleachers rather than the still small voice which has been heard by the streams of Greece. Nor will an examination of the catalogues of our colleges show that the "records" of athletics lead to life's leadership. Anyone who will take the trouble, as I have, to check off the members of Phi Beta Kappa in a single college, like my own, Amherst, will find that those who won this honor and led in after life far exceed those who won their "A." Such have their weight and influence in undergraduate days, a share succeed in after years, but the proportion is smaller than those who met the tests of scholarship, omitting, as is fair, those who in the former case were elected in after life.

Wherever in women's colleges teaching is the frequent future goal, there the numbers multiply of those who "retrace the Grecian cunning from its source," for Wordsworth is one who cherished the fruits of his classic studies in Cambridge in which at St. Johns he distinguished himself.

With decoration of ideal grace;
A dignity, a smoothness like the works
Of Grecian art and purest poesy.

"I got into rather an idle way," he wrote later of his Cambridge days, "reading nothing but the classic authors and Italian poetry," the direct descendant in the peninsular verse accessible in his day of Vergil, Lucretius, Horace and Catullus. His ode on the "Intimations of Immortality," is itself a monument to his knowledge and close study of the Greek chorus. Without that, this could not have been. Reading his classics in this way, in his first year, free from the mathematical doom because he had already covered the Euclid and Algebra of the first year — most admirable example for the youth who wants to enjoy the full liberty of letters and reading in college—Wordsworth was the more awake to the perils of routine classical study: —

In fine,
I was a better judge of thoughts than words,
Misled in estimating words, not only
By common inexperience of youth,
But by the trade in classic niceties,
The dangerous craft of culling termame phrase
From languages that want the living voice,
To carry meaning to the natural heart;
To tell us what is passion, what is truth,
What reason, what simplicity and sense.

Given teaching of a different order and study carried on as Wordsworth practised his reading of the classics in a leisured year, and it is easy to see why the living instincts of women and of teachers turn to ancient study. Lan-

guage is the early field of woman as teacher-mother. Our natal accent, the rhythm of our speech, the fashion in which we enunciate those simple words that make the warp and woof of language on which we later embroider other patterns, are learned at a mother's knee. Happy the child whose mother in school and college days remembered this distant duty and schooled herself to the utterance of a perfected and perfecting English and expression. No later effort of the primary teacher can completely correct the errors caught from a mother's knee; but the one great, effective and universal national agency through which our 105,000,000 are saved from the opaque intricacies of dialects, not mutually understood, is the primary and grammar teachers. They have their lacks and failings, they have their slips and shortcomings, they are often feared by parents more desirous to preserve their social shibboleths than to have their children receive a rigorous democratic training; but none the less our teachers save us from the barriers of dialects that seam and divide all other lands and tongues. Thanks to our teachers, our continental area has fewer obstacles and divisions of this order than civilized lands of a thirtieth of our area.

Classical studies offer the best of all ways to see one's own language detached, to become versed in the boundaries and meanings of words and to feel, if one has patiently worked in Greek and Latin verse, the lilt and measure of English rhythm and meter. Every artist will tell you that you never really know a face, however familiar, until you draw or model it; you never know your own tongue until you have hunted through it for the precise and gracious

words that fit Greek and Latin. If you go a step further and try, however lamely and in however scant a measure, to turn English verse into Latin or Greek, you find a new weapon in your hands.

The teacher has to teach the ignorant. Nearly all the works on education and its theory seem to me to forget this primal fact. To teach, you must remove your own ignorance. No one person who does me the honor to read this, but will instantly remember how one's own paucity and poverty in English grew plain and grew plainer from the first Latin reader on to the "Agamemnon." At every step and stage, you are sounding your own ignorance, your want of knowledge of words and your comprehension of them. If you have a serious discourse to deliver, nothing stirs your well of English, more or less pure as you have guarded it, and gives new words than a span, even brief, of two or three hours' translation from a classic tongue. These be facts.

They are not to be answered by genius which lacks classic knowledge. The wind of genius blows where it listeth. No man can guide it. Even Lincoln gained from reading in translation Homer's "Iliad." He knew our great classic which rests on Greek and Latin foundations, King James' Bible, almost by heart. But I am writing of the average, of the Not-Genius, who have no great gift of tongues given by the cloven flames of Pentecostal powers. It is those who have little of language who profit much and most by the classics. Our experience has already proved how perilous is the betrayal in our colleges, the House of its Friends, of classic culture. From Thana-

topsis to the death of Lowell we had some poet who was read by all the English-speaking world. Where is there such a poet now after forty years of the drying of the springs and rills of Greece? We had essayists and philosophic historians widely read by the English race. Who has to-day the vogue and authority of Emerson and of Motley outside our boundaries? They are gone and they will not return until the old studies of a distant day are again burning in the bush of our national education, giving both life and light as our youth finds itself through these studies again on holy ground.

Sense of beauty is the need of the teacher, next to an awakened, trained, vital sense of one's native tongue. If you wish to learn how atrophied is this latter sense, spend a few appalled hours in reading the theses that are turned out on "English" subjects in our universities from the Pacific to the Atlantic, a large share by those who have abandoned classical studies and lack their inspiration. The critical comprehension and response to beauty as such is the supreme need of the teacher. It is a greater need and a more inspiring influence than mere knowledge. Natural beauty is all about us. This great city which Hunter College so nobly serves, is never without natural beauty, seated as it is among flowing waters, half the area within its boundaries flashing to gulls' winging, knowing sun, moon and stars in its depths and the free winds that caress and smite the tides of the Atlantic as they rise daily on our shore. The school may reek with the radiator and unwashed childhood, "sewn up for the Winter," the street may be a daily proof that to those who give garbage,

garbage shall be given in abundant measure, the lowering houses may shadow thronged sidewalks sounding to all the dialects of Europe, but a step this way or that, and suddenly the surge of the Hudson fills the end of a street, or the churning waters of the East River surge at your feet, or some steep rise looks across houses to the distant blue of ocean. This, thank God, is always present with us. No child is born in this strange city of many marvels, of which the greatest of all is our low child death-rate, but has before long a breath of the damp sea, wreathing mist and fog, or looks on the might and mystery of moving waters.

But though this exist sown with the plentiful hand of sea, winds, glacier, river, rock and tide, there is still needed that inner knowledge of beauty as a garment and perpetual possession of the mind. Buildings fall, statues disappear, paintings darken to mere shadows of their past, all the works of man save the written word, perish with the using. Of the "monuments of art" few there be and few be those that see them. To still fewer is the seeing eye and the trained perception. Much of my work and many of my days have been given to such criticism of art as the modern world of our cities permits. For fifty years, I have seen all that there has been to see on this side of the ocean and much on the other. My early memories are of the trenches dug in Nineveh and its monuments fill my earliest vision. Once at dusk, I looked up unexpected and unknowing at a great graven bull of Ashur-bani-pal with sudden terror, such as the primitive savage may have felt, and knew for the first time the

strange hid-smile on the lips of this symbol of Nisroch. I have studied, I have seen, I have written. There are no galleries of American art in which I can walk without seeing scores of paintings and sculpture on which I wrote at their first appearing by artists whose careers I have, too often, alas! seen from beginning to fruitful end in the forty-six years of my criticism. It lies buried in the illimitable, inaccessible files, I am not regretful to say; but I feel a sincere joy that in a city where I wrote for thirty-one consecutive years on the annual exhibition I had the overflowing reward of knowing that however far I fell short, many artists felt I was the defender of the claims of art, the pleader for its supreme need in our American life, the interpreter and revealer of what they sought to do. But when I look back on this span of study, of patient devotion, of earnest desire rather to show where an artist was right than to prove him wrong, I am appalled at my early ignorance, of the labors that went to what little knowledge I have won, and how scant and short I am, after all these years given to the patient appreciation of the art of many lands, East and West, of any true and accurate comprehension of this vast field of the beautiful which the most industrious and best travelled of Americans sees, after all, so little.

But the written word abideth and changeth not, though art passeth and few with regardful eyes look thereon, to see the little that remaineth. "Let us now praise famous men and our fathers that begat us. Leaders of the people by their counsel, and by their knowledge of learning, meet

for the people, wise and eloquent in their instructions, such as recited verses in writing." These remain and pass not away. Behold they stand from everlasting to everlasting and their scrolls shall remain until the Heavens are rolled away like a scroll in an effectual fervent heat and man hath gone to his last home from the earth that shall know him no more, forever moving voiceless among the worlds that were and are not.

For us all, the treasure and garner of man on this round threshing floor of earth, his feet have trod through the centuries, are the ancient letters of which I speak which give the teacher to hold in one's own hand and heart, furthermore, eternal beauty open to all, accessible for all, which passeth not away. If you sit but once to read but once a play heard but once in the Dionysiac theater, there remaineth for you a perpetual treasure of beauty. If the tender radiance and Roman majesty have shone but once on your path, you have lifted up a standard before your path for all your days. Some line from a chorus will come to you in a darkened moment and bring light. Some phrase, which has sunk into the subconscious mind, will guide your pen. Your lips will shape again some thought of consolation, some word of inspiration, beautiful for situation, the joy of a whole life, which Plato has given you. Whether it be the form over which you toiled, the precise utterance which you phrased again for yourself will elevate your use of your own tongue. The sense of beauty will crown your life, enrich your days and shed light on your path. These things are a new spring and a sure guide to the controlling sense of beauty.

The choice which so many of the undergraduates of Hunter College have made for classic studies is justified by these things. Beauty and not knowledge is the saving grace of life. Without it knowledge is but heaviness and the increase of learning but despair that has no surcease. To science Dr. Wilson has given her life. Her labors have all been in this field, labors devoted alike to humanity and to education. Greek science itself began in this spirit. The little Greek island of Cos gave Hippocrates, and medicine had from him its first consciousness not alone of healing, but of growth and of nutriment, with all the radiating and related processes of both. It chanced to me once, to come a stranger into Hunter College and blindly seeking my way to end seated in Dr. Wilson's room. I did not know her name, nor did she mine, through the half hour in which we talked alone. In time I was found by an active messenger and speeded on my errand. I went on, I remember, feeling I had met an Attic spirit, for the spirit of Athens was not, as many mistake, contemplative or vague or fanciful. The spirit of Athens was direct, practical, immediate. Beauty was a means and not an end. Philosophy was no search for the ultimate or probing of the infinite. It was a direct discussion of life as it was and thought as it showed itself in the daily ways, work and walk of men. The practical advance and progress of Athens as a place to live in guided the whole range of Greek literature. Homer recited his poems for the same reason movies exist to-day, because people wanted them. Every play we have was as directly related to current causes and affairs as a newspaper. None of Greek

eloquence was in its Attic days composed for "leave to print." It was all as vital as a campaign speech. Woodrow Wilson, as his first preparation to lead the Nation, began by bringing, as he told me, the body of Demosthenes to a point where he could read any page at sight, and his speeches are modelled on the great orator who shook the Arsenal and fulminated over Greece.

Nor could Dr. Wilson's labors be better described than in the lines:

The cry of the conscience of Life:
Keep the young generations in hail
And bequeath them no tumbled house.

TALCOTT WILLIAMS

PHYSIOLOGY AND PSYCHOLOGY

MODERN psychology grew up in close relation to physiology. It was, in large measure, an offshoot of physiology. What we now call the "older" psychology, reaching down to the middle of the nineteenth century, was more often called "mental philosophy," and properly so, since its associations were almost exclusively with philosophy. Few anticipated that psychology would ever find use for such a thing as a laboratory; and in fact few realized what a perishing need psychology had of more extensive data, and more precise data. But among the sense physiologists of the first half of the nineteenth century, there were quite a number whose experimental researches took them into fields closely bordering upon that of psychology. E. H. Weber, for one, after studying the cutaneous and muscular senses, and after noting, in particular, the peculiarity of sensory discrimination which was afterward to receive the name of "Weber's Law," ventured to call the attention of psychology to his methods and results, in the hope that they might prove interesting and suggestive. While it cannot be recorded that psychology immediately reverberated to this call from a sister science, to-day we honor Weber as the first definite precursor of experimental psychology.

Weber's most direct successor was Fechner, a physicist by profession, but a peculiarly original and independent

investigator whose work was largely extra-professional. He took an extraordinary interest in Weber's law, and labored valiantly in devising experimental methods for putting that law to a rigid test, and in devising statistical methods for treating the data of his experiments. Later in life, he adapted these methods to the study of other psychological problems, especially those of experimental esthetics. He can well be named the first experimental psychologist.

Helmholtz, a contemporary of Fechner, being a physiologist by profession and interest, can scarcely be claimed as a psychologist, but was certainly the greatest of the precursors of experimental psychology. His remarkably complete studies of the senses of sight and hearing carried him beyond the sense organs into problems such as those of space perception and tonal harmony. Also, he is dear to psychologists as the first to devise an experiment on reaction time. This he did with the purely physiological object of measuring the speed of conduction of the sensory nerves, but he was soon followed by the Dutch physiologist, Donders, who extended this line of study to complex reactions, with the object of measuring the speed of the simplest mental operations; and when, soon after this, psychological laboratories began to appear, the reaction time experiment was taken over as a regular stand-by.

This movement from physiology towards psychology took definite shape in the work of Wundt, who, starting as a physiologist, and serving for a time as Helmholtz's assistant — but also influenced very much by Fechner —

published in 1873 an extensive treatise with the surprisingly novel title of "Physiological Psychology," and in 1879 established at the University of Leipzig a psychological laboratory. Other similar laboratories were soon started in many universities, and not a few of them were manned by pupils of Wundt.

But it would be going altogether too far to speak of modern psychology as entirely an offshoot of physiology. We must not overlook the continuity of interest from the older, pre-experimental days of mental philosophy down to the present. Nor must we overlook the influence of two other sciences besides physiology. Biology, when it came to study evolution, opened up a field as important on the mental side as on any other. Heredity and variation, ontogeny and phylogeny, had a psychological aspect, and the great present interest in animal psychology, in child psychology, in mental heredity and in individual differences, can be traced back to Darwin, who must thus rank as one of the precursors of modern psychology. Galton is the outstanding representative of the early psychological work along this general line.

Nor must we overlook the influence of psychiatry upon psychology. Ever since Pinel, shortly before 1800, "struck the chains" from the insane in a Paris institution, and demanded that they be treated and studied as human beings, the problems of abnormal mentality have formed a part of the task confronting the science of psychology, and the data of abnormal behavior have provided an important section of the foundation upon which psychology is privileged to build.

All in all, psychology can best be considered as an out-growth of biological science in the broadest sense, rather than from any single one of the biological sciences. Yet it remains true that the most decisive step in the creation of psychology as a natural science was the founding of psychological laboratories after the model of those existing in physiology.

The technique of psychological investigation was accordingly derived in no small measure from physiology; and it may be worth while to ask just what, in the way of method, physiology did contribute.

First of all, we must notice the great use psychology has found for physiological registering devices, such as were developed in the laboratories of Marey and Ludwig. The kymograph has been put to many uses. Muscle levers, ergographs, sphygmographs and pneumographs have been applied in the study of voluntary and involuntary movements, emotions, etc. In certain directions, such as photographic registration of eye movements, psychologists have made notable contributions to the improvement of the graphic method. Generally speaking, we may say that psychological technique for the study of muscular responses is an adaptation from physiology; and the same is true of technique for the study of secretory responses, so far as psychology has begun to experiment along this line. Up to the present time, comparatively little use has been made in the psychological laboratory of the technique of chemical physiology.

But it was sense physiology that most directly supplied the psychological laboratory with a ready-made tech-

nique. The method of sense physiology consisted, first, in controlling the stimulus, and, second, in expert observation of the sensation produced. For controlling the stimulus, sense physiology supplied color wheels, perimeters, standard tuning forks, resonators, olfactometers, touch hairs, and a whole battery of similar apparatus.

The "expert observation of sensation" is what is known as "introspection"; and it may be rather shocking, to both physiologists and psychologists, to hear this much-discussed method spoken of as a heritage from the physiological laboratory. Do not the introspective psychologists acclaim introspection as the peculiar glory of psychology, and do not hard-headed natural scientists, including physiologists, look askance at psychology for its dependence on just this method? Further, was not psychology most "introspective" before its affiliation with physiology?

In answer to this last question, we can say, "No, the older psychology was not based upon introspection in any strict sense." It was reflective rather than introspective. It was based on the same sort of reflective thinking that occurs whenever any question arises, for example in chemistry, which one answers as best one can, in the light of past experience and general considerations, without recourse to any fresh observations. Introspection, on the other hand, is a form of direct observation, a means of gaining fresh empirical data, and as such it was apparently first practiced by the sense physiologists, as by Purkinje in observing entoptic phenomena, by Weber in observing temperature adaptation, by Helmholtz in ob-

serving overtones, and by those who established the existence of visual contrast and after-images, of beats and difference tones, and of a host of such "subjective sensations."

The technique of such introspection consisted, first in securing the services of a trained and trustworthy observer and instructing him as to what sensation to watch for, next in presenting this observer with a carefully controlled stimulus, and finally in recording his testimony as to the sensations experienced. It is also necessary, of course, to check the testimony of the single observer by that of others, equally competent. This is the method of the introspective psychologists of the present day, who have endeavored, to be sure, to refine the method and to utilize it in problems that lie beyond the interests of sense physiology.

If the method of the introspective wing of present-day psychology is thus derived from the sense physiologists, the ideal of the other extreme wing, the behavioristic, is to substitute for introspection minute records of the motor and secretory responses of the man or animal under observation. Thus the distinctive behavioristic technique, no less than that of the introspectionists, originated in the physiological laboratory.

It may fairly be said, however, that the center of the psychological attack, as distinguished from these extreme wings, is being carried forward by a technique which did not originate in the physiological laboratory, but was contrived by psychology itself. It was derived by psychology from every-day experience and practice, rather than

from any antecedent science. Essentially, it consists in setting the subject of the experiment some task to be performed, and then in measuring the success with which the task is performed. The conditions are of course controlled, and they may be varied in order to compare the performance under different conditions and thus to throw some light on the inner mechanism by which the task is performed. Experiments of this sort go back, in some slight measure, to the astronomers with their study of the "personal equation," and to the reaction time work of Helmholtz and Donders. But they go back, more particularly, to Fechner's measurements of ability to distinguish weights and other magnitudes, to Galton's beginnings in the way of psychological tests, to Ebbinghaus's experiments on memory, to Bryan and Harter's work on the effects of practice, to Thorndike's experiments on the learning of animals. All mental tests come under this general method, as do many laboratory experiments that do not belong properly under the head of tests.

We should mention, in passing, that some of the technical procedures employed in psychological investigation have been derived also from biology and from psychiatry. From biology, more specifically from biometry, have come statistical methods that are of extraordinary use in psychology. Dealing with extremely variable phenomena, psychology has great need of statistics. From psychiatry has come the method of hypnosis, which has been applied by the psychopathologists, especially, for the obtaining of psychological data; and from psychiatry, also, has come psycho-analysis, which, considered in a broad sense as

a means of obtaining an intimate case history of the individual, should be a source of important data.

It is an interesting question, in view of the close relationship between physiology and psychology, whether any definition can be framed that shall sharply distinguish them, so as to assign to each a separate field of work.

One distinction which has been attempted is to the effect that physiology, like physics and chemistry and botany, is concerned with certain parts of the physical world, whereas psychology is concerned with an inner world of consciousness. It would take us too far afield to make plain the logical difficulties that inhere in this seemingly clean-cut distinction; and it will suffice to point out that this line of cleavage, if it could be drawn, would leave the sense physiologists, in much of their work, on the psychological side of the boundary, and the behavioristic psychologists on the physiological side; in other words, it would not square with the actual or historical division between the two sciences.

A more obvious distinction which readily suggests itself is that physiology is concerned with the bodily activities of the organism, and psychology with its mental activities. Mental activities, if this is to be a real distinction, must be entirely non-bodily. But do we know of any activities of the organism that are performed without the use of sense organ, muscle, gland or nervous system? If not, psychology is left without any field, and exists only by sufferance, until physiology has time to catch up with its work. But we can turn this argument the other way around, just as logically, if not quite so convincingly. If

the physiologist should observe bodily activities, not under anesthesia or decerebration, but in the intact and fully active subject, he would find—he has found—that secretion, digestion, metabolism, circulation, are very much involved with activities which any one would call mental—with emotions, efforts, hopes, fears, distractions and mental work. In the end, he might come to doubt whether there were any bodily activity that was not at the same time mental, and whether physiology was not a temporary stop-gap against the time when psychology should rise to its responsibilities.

Another distinction would be to recognize the probability that any mental activity is at the same time bodily, and that any bodily activity of the intact organism runs at least a good chance of being mental as well—and then simply to say that physiology considers any or all of these activities *as* bodily activities, and psychology as mental activities. To make this more than a mere verbal distinction, we must substitute more definite terms in place of "bodily" and "mental." We might say that physiology is concerned with analyzing the activities of the organism into activities of its several organs, whereas psychology is concerned with these same activities when the organism is viewed as a whole. Thus, physiology would be concerned with hearing as a function of the ear and its neural apparatus, while psychology would be concerned with sensations of sound and reactions to sound, without reference to the organs involved. Physiology would examine the workings of the brain in perception and memory, while the data that psychology has accumu-

lated on these processes would not be affected even if, contrary to all probability, it should some day be discovered that the brain functioned simply as a big endocrine gland.

In a broad way, this last distinction certainly fits the actual work of the two sciences fairly well. It is very much the same as saying that physiology is concerned with intraorganic life, and psychology with the life of relation. When physiologists raise the cry, as they do from time to time, that their science should consider the animal as a whole, and not simply as made up of separate organs, what they are apt to mean is that the interaction of the different organs and parts of the animal's body should be studied. This is a matter which would fall to physiology and not to psychology, under the proposed distinction. Psychology could almost afford to ignore the existence of organs.

The distinction which makes physiology a study of organs and their interrelations, and psychology the study of the organism in its external relations, would, however, seem to break down here and there. In a metabolism experiment, where total body weight is correlated with temperature, or where nitrogen output is correlated with food administered, no account may be taken of the organs, but the activities of the whole organism are considered in relation to certain environmental facts. Yet no one would think of calling this psychology. Also, it is in strictness impossible to consider intraorganic life without any reference to environmental stimuli. Perhaps the best that we can do is to make a rather hybrid

definition, somewhat as follows. The situation that has given rise to physiology is the existence of an organism which (1) is made up of various organs, and (2) shows certain fundamental adaptations to the world, such as metabolism, sensitivity and motility. Physiology, responding to the problems thus set before the inquiring mind, accepts the obligation of determining the function of each of these organs, and the mechanism of each of these fundamental adaptations. Psychology, on the other hand, is a response of the inquiring mind to the existence of an organism showing an active life of relation, involving especially certain adaptations, such as learning, thinking and feeling, that seem less fundamental than metabolism, sensitivity and motility, less closely related to the elementary physical and chemical processes that go on in the body, and less easily analyzed into the functions of different organs. Consequently, psychology has gone a different way from physiology, accumulating data on the response of the organism to various stimuli, and not bothering itself much about the particular organs involved.

Such a distinction would not make either of the two sciences less worthy or necessary than the other, even though it would seem to make physiology the more fundamental. Cellular physiology is more fundamental than organ physiology, and yet organ physiology is just as necessary as it was before the development of cellular physiology. In the same way, the great development of histology has not laid gross anatomy on the shelf. Looking through a microscope, you could never see the heart

nor the heart-beat. In the same way, physiology may, in a sense, be more fundamental than psychology, but it will never do the particular work of psychology. There is room enough for both.

Much more important than delimiting the provinces of physiology and psychology is the work of keeping the two sciences in close relation with each other, and such a subject as "physiological psychology," though something of a mongrel, is well worth cultivating. The value of such mediating sciences has been abundantly proved in other cases, such as physical chemistry, or chemical physiology. Curiously enough, psychology is sometimes very sharply warned to keep its skirts clear of any contamination with physiology. And, curiously again, it has recently been a branch of medicine, psychiatry, that has issued this warning to psychology. Usually, the complaint of medicine regarding psychology has been to the effect that it was not physiological enough; but here we have a branch of medical science complaining of the "materialistic tendency" of psychology. Of course, one recognizes that psychiatry has had its own internal conflict between the "somaticists" and those who found little profit in neural anatomy and physiology, and that the above complaint regarding psychology comes from the "psychic" wing of psychiatry. And of course also — what is more to the point — one realizes that psychologists often make rather amateurish use of physiology, for lack of sufficient knowledge of the subject. But, ideally, only good can come from bringing together knowledge from the two fields. The behavior of the organism as a whole should be related

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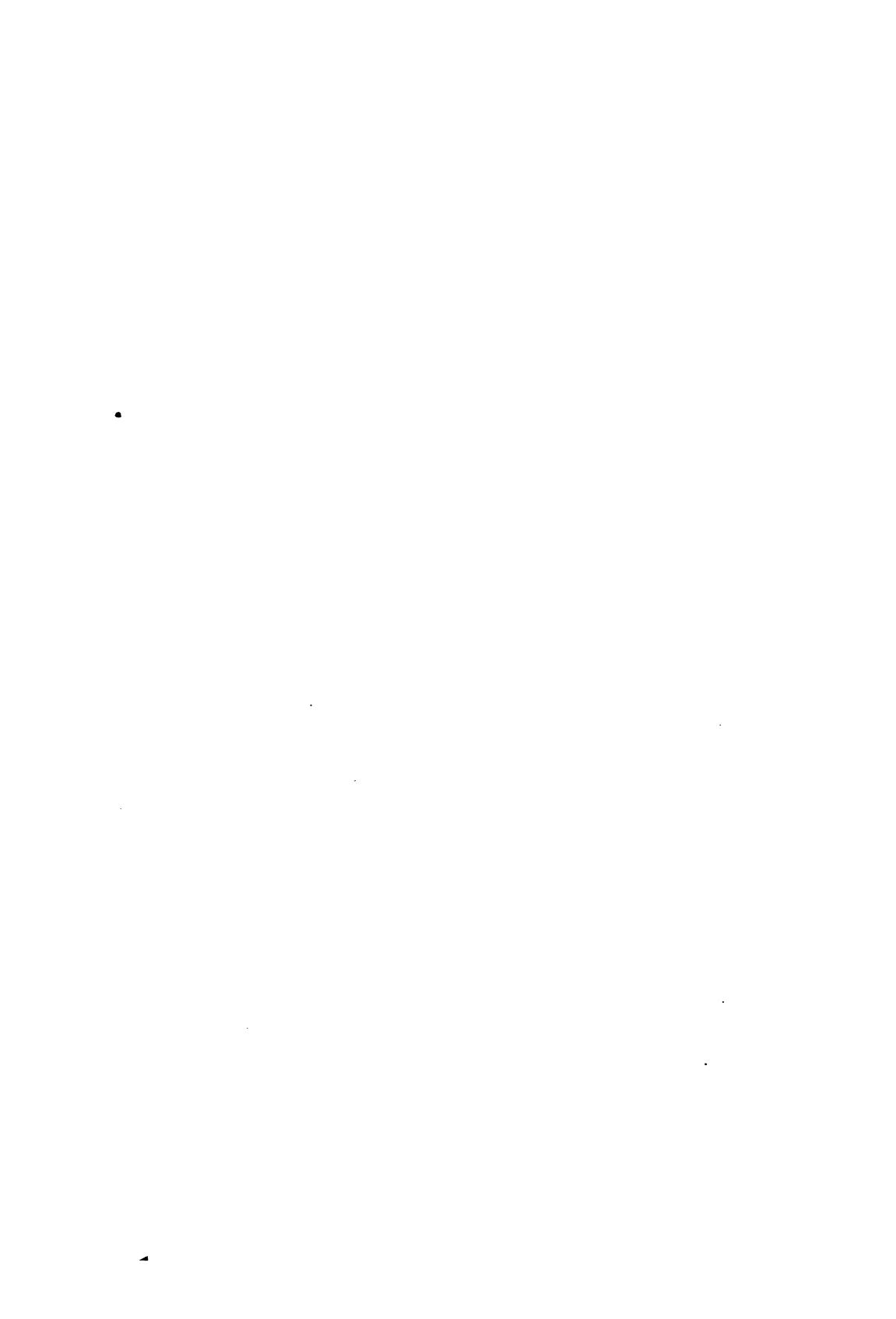
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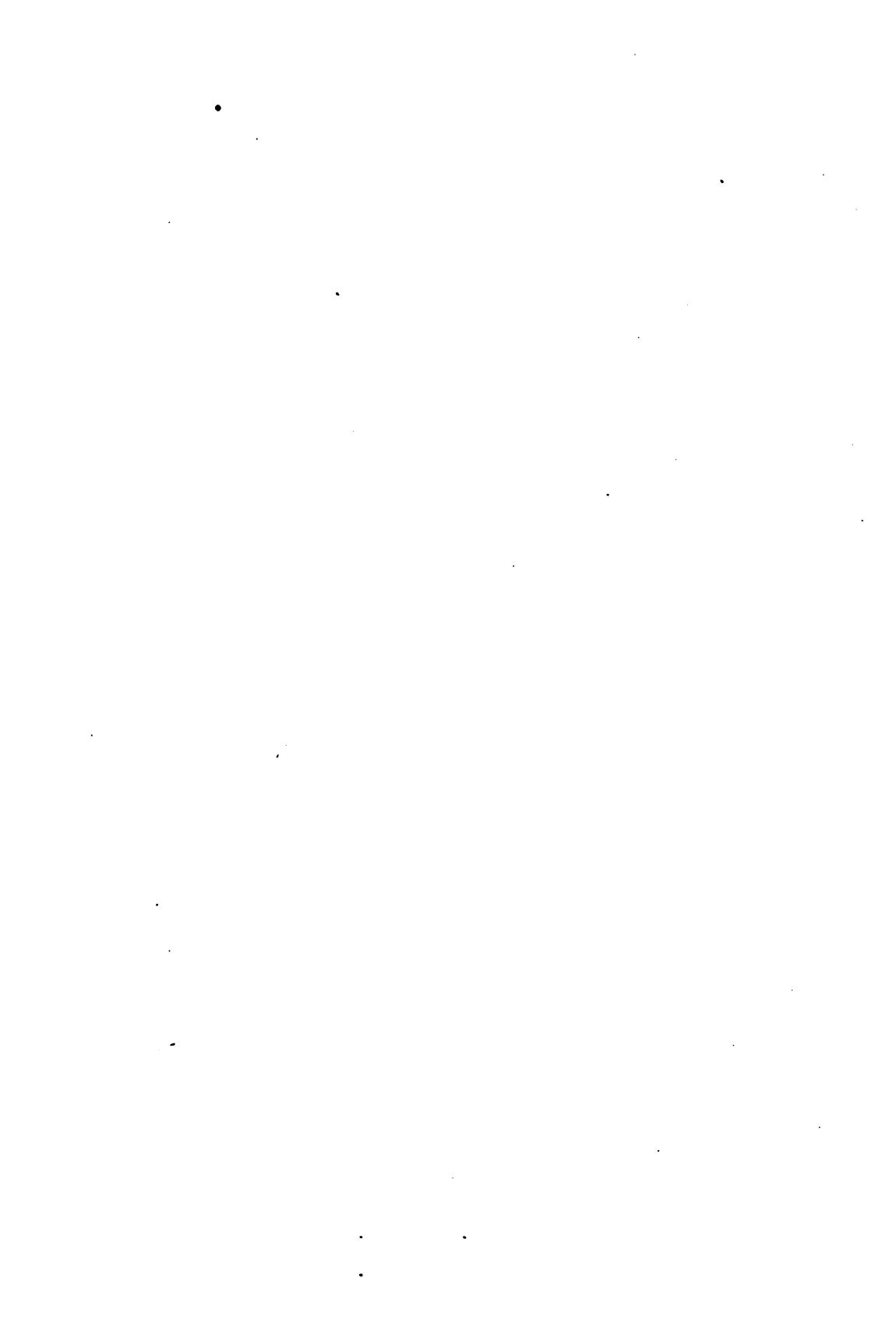
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